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BULLETIN OF THE HISTORY OF MEDICINE

ORGAN OF THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE
AND THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE

Founded by HENRY E. SIGERIST

Acting Editor—GENEVIEVE MILLER

VOLUME XXII MARCH–APRIL, 1948 NUMBER 2

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THE JOHNS HOPKINS PRESS

BALTIMORE 18, MARYLAND

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Correspondence relating to the publication of papers should be addressed to The Acting Editor, Bulletin of the History of Medicine, 1900 East Monument Street, Baltimore 5, Maryland, U. S. A.

Twenty-five reprints without covers will be furnished to contributors free of cost. An order slip for additional reprints, giving the cost, is sent with the galley proof to each contributor and must be returned immediately to the Editor.

The journal is published bimonthly. One volume of at least 500 pages is published during the year.

Subscription is $5.00 a year in the United States and its possessions; in Canada $5.25 a year; in foreign countries $5.50 a year. Single numbers, when available, will be $1.00 each. Members of the American Association of the History of Medicine receive the Bulletin on payment of $5.00 annual dues, of which $4.00 is for a year's subscription to the Bulletin.

This journal will publish book reviews, and publishers are requested to send review copies to the Editor.

Back numbers of Volume II–VIII and XXI of the Bulletin of the History of Medicine are available through the Johns Hopkins Press for $5.00 a volume, of Volumes IX to XX for $2.50 each. Volume I is out of print.

Supplements to the Bulletin are published at irregular intervals and are sold individually, whereby subscribers to the Bulletin are granted a reduction of price. Standing orders for the whole series of Supplements may be addressed to

THE JOHNS HOPKINS PRESS

BALTIMORE 18, MARYLAND, U. S. A.

PUBLISHED BIMONTHLY

January-February, March-April, May-June, July-August, September-October, November-December

Made in United States of America

Entered as second-class matter January 3, 1935, at the post office at Baltimore, Maryland, under the Act of March 3, 1879.

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HYGIENE IN FRANCE, 1815-1848 *

ERWIN H. ACKERKNECHT

À Henry E. Sigerist qui a guidé mes débuts dans l'histoire de la médecine en témoignage de mon affection et de ma reconnaissance.

It is generally and rightly assumed that the years around 1848 are the starting point of modern *hygiene,* public and private (or of *preventive medicine,* as we now usually call it); and that Chadwick's England and Pettenkofer's Germany are the protagonists of this movement. It has become increasingly clear that the "enlightenment" of the 18th century had already produced very important efforts along these lines in England as well as Germany and France.[1] Temkin and Rosen have recently stressed the role of the French "idéologues" for the later parts of this chapter in the history of hygiene. However, there still remains an odd gap of about 50 years—the first half of the 19th century—to account for. Insofar as historians have been conscious of this gap at all, they have

*I am indebted to the University of Wisconsin Medical School, Madison, Wisconsin and the Viking Fund, New York, N. Y. for financial assistance in the preparation of this paper.

[1] Cf. Welch 1925, p. 22, Shryock 1936, p. 89 ff., Hueppe 1925, Rubner 1911; for full titles see the terminal bibliography that lists sources in the first, other writings quoted in the second division.

regarded it as real and explained it by the egotism of the bourgeoisie [2] or the destructive effect of the Napoleonic wars,[3] whatever that might mean. While this gap might, to a certain extent, be an actual fact as far as England and Germany [4] are concerned, in the case of France it exists only in the history books. In France, as shown in the following short survey, the hygiene movement of the enlightenment and of the ideologists continued uninterrupted in literature and practice, undergoing the same changes from systematism and analytic philosophy to atomized experimentalism that characterize the development of French medicine in general during the period. The hygiene movement probably reached an all-time peak in France in the years between the Napoleonic wars and 1848; and France, which was known as the leader of Western Clinical Medicine (and in many other fields of science and the humanities) for these years, might well be credited with the same leadership in hygiene (preventive medicine) for the period under discussion.

Let us qualify this statement in order to avoid disappointments and misunderstandings. In spite of its greater utility, preventive medicine, in history and practice, has never been surrounded by the halo that adorns clinical medicine and surgery. This statement is even more valid for our particular case. While clinical medicine became increasingly impressive from the time of the Renaissance, preventive medicine had not gained this quality until near the end of the 19th century. French hygiene of the period has, furthermore, none of the dramatic inventions or personalities that medicine has. Hygiene has a Louis in the person of Villermé. It has no Laënnec or Dupuytren.

Leadership is something relative—among the blind the one-eyed is king. Relatively speaking, the French hygiene of 1815-1848 is superior indeed to English or German hygiene, through the truly amazing quantity and respectable quality of its literary output as well as through its practical accomplishments. In the early 1820's the leading Prussian medical statistician, Casper, recognized, for instance—and certainly without pleasure—the superiority of French public welfare institutions,[5] of French public latrines, methods of excrement removal, slaughterhouses, etc.[6] It is hard for us children of the 20th century to think of France as the vanguard of hygiene. Yet we have to recognize facts, and it is one of the great advantages of the study of history that we are continuously forced to renounce cheap stereotypes and to realize the enormous and permanent

[2] Cf. Sigerist 1933, p. 330.
[3] Cf. Welch 1925, p. 23; Rubner 1911.
[4] See A. Fischer 1933, vol. 2.
[5] Casper 1825, I, p. 99 ff.
[6] Casper 1822, p. 529, p. 524.

changes in civilization. Three hundred years ago Sweden was the terror of Europe, and 400 years ago Spain ruled the world.

It is a strange fact, to which we might return later, that this French movement has either been overlooked or completely forgotten by most medical historians, general and special, and apparently by even the French themselves. Such reliable reference books as Haeser or Daremberg, have next to nothing to say on the subject; Bouillet and Garrison very little. Nothing is found in Bouchut, Delaunay, Meunier or such special historians in the field like Hueppe, Newsholme, Prausnitz, Proust, Rubner, Welch, Weyl, or Winslow. To what extent the French themselves have forgotten their own past, is obvious, e. g., from Girard's remark in 1936 that " le terme hygiène sociale ne date que d'un demi-siècle." [7] The only historians to give due attention to this movement are Baas, Pagel, and Bertin-Sans. Yet, even the material discussed by them forms only a small part of our terminal bibliography which, in turn, is anything but comprehensive.

To start our story in 1815 at the end of the Napoleonic wars is, to a certain extent, arbitrary. Still, the France to which many of our protagonists returned after years of military service was sufficiently different politically, morally, and economically from the France of the " philosophers," the revolutionists, and the ideologists to justify such a classification. In France the " Napoleonic wars," this bugbear of some historians, seem to have increased rather than stifled knowledge and understanding of hygienic problems, private and public, and their application.[8] Former and active army medical officers supplied a considerable contingent of our hygienists (as they also did for obvious reasons in later developments in public health and bacteriology; *vide* Villemin, Laveran, R. Ross, Walter Reed, Gorgas, Löffler, Gaffky, von Behring, etc.).

When the " veterans " of 1815 started their study of hygiene, they found in Paris the unparalleled institution of a regular chair of hygiene, one of the many creations of the revolution in the medical field.[8a] The chairholder was *Jean Noel Hallé*, " le lien entre le 18e et 19e siècle " [9] (1754-1822), nephew of Anne-Charles Lorry, this most disturbing, frivolous medical genius of the " ancien Régime." [10] Hallé's chair was created in 1794 by Fourcroy (1755-1809), like Hallé a protagonist of

[7] Girard 1936, p. 49.
[8] Vaillard 1920, p. 401.
[8a] See Proust 1895, p. 485.
[9] M. Lévy 1844, p. 43; see also Desgenettes, 1822.
[10] Delaunay 1905, p. 39 ff.

Vicq d'Azyr's prerevolutionary Société Royale de Médecine and a victim of the intrigues of the Faculté. Hallé started hygienic work in 1785 with a memoir on the "mephitisme des fossés d'aisances," and took up the defense of Jenner's vaccination in 1804. He wrote on miner's anemia in 1802. His course on hygiene was published in 1806; and a combination of his writings and those of Tourtelle (1st ed. Strasbourg, 1797) were still reprinted in 1855.

Tourtelle of Besançon (1756-1801), according to M. Lévy the "Pinel" of Hygiene, was no longer alive in 1815. Nor was *Cabanis* (1757-1808), the leader of the ideologists, who like Tourtelle, was outstanding as a student of the influence of the moral on the physical phenomena. But we will see how great Cabanis' influence on French hygienists was for decades to come.[11] His approach to the relations of body and mind had opened new vistas in the field of physical and mental hygiene. Hygiene-minded comrades of Cabanis from the Société Médicale d'Émulation of the year IV (1795) like Desgenettes (1762-1839) and Marc (1771-1841; M. D. Erlangen, 1792; M. D. Paris, 1811) were still active in 1815. The official representative of the ideologists at that time was *J. L. Moreau de la Sarthe* (1771-1826),[12] medical officer in the revolutionary armies, in 1808 librarian of the Faculty, and in 1815, Professor of the History of Medicine. (He was suspended by the reaction in 1822.) Moreau was Professor of Hygiene in the Lycée Republicain in 1799 and published his course in 1800. His classification, a new attempt, opposed to Hallé's traditionalism, was much imitated in the 1820's. In 1801 he came out for vaccination.

F. E. Fodéré [13] (1764-1835), a most forceful and original personality, another ex-soldier, had eventually found a haven in Strasbourg in 1813, where he was to do no less for public hygiene than he had done before for legal medicine with his fundamental treatise in 1792. Let us emphasize at this occasion that in spite of an occasional personal identity between the hygienist and the man interested in legal medicine, our field had already come of age, and was an independent unit. (All "mixed" books have been omitted from the bibliography). Men interested in legal medicine were by no means preponderant. At least as large a proportion of clinicians were engaged in the study of hygiene.

Our bibliographical approach should not create the erroneous idea that in the period under discussion there was nothing but book writing and

[11] Cf. Rameaux 1839, Villermé 1840, Cérise 1842.
[12] Delaunay 1920.
[13] Bellier 1930.

theorizing about hygiene. Though realization was not on the same level as theory, the time was still far off when a French hygienist was to write melancholically:

Toujours en avant dans le domaine de l'idée, et en retard sur le terrain de la pratique nous avons décrété l'institution sur le papier, et oublié d'en assurer l'exercice.[14]

As a matter of fact, the Conseil de Salubrité de la Seine, created in 1802 and extended in 1807 (in many ways following old plans of the Vicq d'Azyr's Société Royale and the "Constituante"),[15] was an exemplary and useful institution [16] which was imitated by other great cities of the country in the course of the years following 1815. France was a pioneer in labor legislation in 1810,[16a] and in voluntary health insurance, having 120 Sociétés de Prévention in 1822.[16b] The deep roots of our movement in the national past show that it was mostly home-grown. Of course, there had been some cross-fertilization, all the more since the men of the enlightenment were still cosmopolitan as compared with the nationalism of the romantic period. Men like J. P. Frank, Jenner, John Sinclair had made a deep impression, but the 19th century French hygienists got their main impulses from native problems and native thinkers. Though having many features of its own, hygiene, with men like Hallé, Londe, Villermé, followed or paralleled clinical medicine's way from Pinel's systematizing philosophy through Broussais' pseudophysiology to Louis' numerical method. ("Envisagé comme un ensemble de lois et de règles, l'hygiène est solidaire des théories qui se succèdent dans la médecine.")[17]

1815-1848[18]

In 1816 appeared the first hygienic treatise of the military surgeon *Réveillé-Parise* (1782-1852) who was to become an important author in our field.[19] In 1817 *Kerandren* (1769-1857), the naval surgeon, condensed many of his detail studies into a book on naval hygiene. *A. L. Gosse* (b. 1791), participant of the Greek war of liberation, anthropol-

[14] Bertin-Sans 1888, p. 789.
[15] Ingrand 1939.
[16] Uffelmann 1878; Shryock 1936, p. 93.
[16a] Garrison 1934, p. 686.
[16b] Sigerist 1936, p. 608.
[17] M. Lévy 1844, p. 46.
[18] In the following chronological survey, not all items listed in the bibliography will be discussed, partly because not all have been available, partly because many do not deserve special analysis within the limits of this article.
[19] Like several of the authors discussed below (e. g. Bouchardat, Chevallier, Dupin, Guérard, Jolly), Réveillé-Parise published his best work (in this case his treatise of 1853 on old age) after 1848. Thus it cannot be included in our bibliography.

ogist,, and son of a pioneer in occupational diseases, started a long career in public hygiene with two treatises on dangerous trades (1816, 1817).

1818

In 1818 *Hallé*, the dean of the hygiene movement, published together with Nysten, his important contributions in the famous Dictionnaire des Sciences Médicales, while *Louis René Villermé* (1782-1863), who was to become the outstanding French hygienist of the 19th century, had eventually freed himself from military service and private practice, and published the first of his numerous hygienic memoirs.[20]

The appearance of no less than nine Paris doctoral theses dealing with hygiene (Ledesert and Tillionbois on the hygiene of pregnant women, Moulinet on the hygiene of old age,[21] Blot, Douet and Tacheron (b. 1790) on child hygiene, Villevert on preventable diseases, Compère and Desmoulins on hygiene in general) shows how well established the discipline was by 1818. *Villevert's* thesis was a rather shameless but improved copy of Faulcon's thesis of 1812. Prevention was characterized as an Hippocratic heirloom which had to be rediscovered. Jenner's accomplishments were a great encouragement in this direction. *Compère* also argued that the essence of Hippocratic medicine is hygiene. Like his mentor, Desgenettes, and many of his contemporaries, he was particularly interested in a revival of *gymnastics*, a field later cultivated most extensively by Dally. Like several other sources Compère mentioned favorably the gymnastic institute of Colonel Amoros at the Jardin des Plantes, inspired by the Greeks and the German "Turner." With Compère the accent was on public hygiene—the successes of Jenner, antimalarial drainage,[22] and food control serving as his main examples. Desmoulins (1794-1828), later known as an anatomist, presented for the most part a rehash of Hallé and Cabanis.

[20] Only such memoirs of Villermé as are directly referred to will appear in the bibliography. For a more complete list see Delabroise 1939.

[21] Four more treatises on this subject will be found in the bibliography. It seems that during the first half of the 19th century the French were also pioneers in what we now call geriatrics and believe to be something very new. Geriatric treatises were published e. g. by Auchner (1804), Ballot (1822), Belloir (1817), Brossard-Ysabeau (1815), Chaussard (1822), Delphin-Lamothe (1806), Delseriès (1802), Henry (1821), Junin (1813), Mauvif-Montergon (1804), Millot (1807), Secretain (1827), Venus (1837), Vinache (1816). In the second half of the century followed the better known works of Hourman-Dechambre, Durant-Fardel, Réveillé-Parise, and Charcot. (Exact references in Surgeon-General's Library Catalogue).

[22] This was even the object of a revolutionary law of 1793; see Rameaux 1839, p. 7.

Doubts might be raised here concerning the inclusion of doctoral theses in our survey and bibliography. As far as content goes, they are, of course, not on the same level with most books or memoirs of original and mature authors, and they quantitatively obscure the comparison with countries where theses were not uniformly required. They are, on the other hand, such excellent indicators of the general trends, interests, and opinions of a period that we would deprive our study of valuable illustrative material should we omit them altogether. The three theses on child hygiene in 1818, for instance, are graphic expressions of the strong interest in *child hygiene* in France during our period, an interest, which was also reflected in the exemplary clinical work of Charles M. Billard (1800-1832), and which provoked the production of more than 20 theses on the subject between 1815 and 1848.

It is typical for the "climate" of opinion that at the foundation of the Royal Academy of Medicine in 1820 occupation with public health problems was expressly set as one of the main tasks of the Institution.[28] In the same year, the military surgeon, *Moreau de Jonnès,* whose writings were so influential in forming contemporary epidemiological thought, published his treatise on yellow fever in the Caribbean Islands, based on 14 years of observation. Interest in prevention of epidemics was not exclusively a result of the 1832 cholera, as one so often reads. *L. F. Benoiston de Chateauneuf* (1776-1856), originally a military surgeon, produced the first of his many important medico-statistical memoirs: on the food consumption of Paris in the year of 1817.

1821

The 1821 thesis of Grosourdy was largely influenced by Hallé. *Meirieu* took up one of the most controversial subjects of the period: the relations between civilization and disease. Charles Londe (1795-1862) made his appearance with a book on *gymnastics.* The thesis of Letourneur on the *relations of the doctor to society* referred to Cabanis. It was a development of the 1806 thesis of *Thouvenel,* who in his turn used "the method of Destud Traci (sic!)."[28a] It seems worthwhile to quote from Thouvenel the following passage which shows the basic role that a very universal notion of hygiene assumed in the medical thought of these men:

Il est donc bien important, pour le bonheur de tous qu'il (l'homme) soit placé sous

[28] Vaillard 1920, p. 401.

[28a] Antoine Louis Claude Destutt de Tracy (1754-1836) was, together with Cabanis, the leader of the "idéologues."

la puissance sacrée du médecin; qu'il élevé, nourri, habillé d'après ses conseils, et que les systèmes d'après lesquels on doit le gouverner, l'éduquer, le corriger, etc., soient tracés par lui, et les causes qui peuvent le changer ou modifier, car qui plus que le médecin est propre à remplir une pareille fonction, lui qui a fait une étude approfondie de la nature et des lois de son organisation physique et morale? [24]

Perhaps the most important event of 1821 was the appearance of *A. Parent-Duchatelet* (1790-1836) in the field. Parent-Duchatelet's work, which is very similar to Villermé's, made itself felt almost immediately. The ailing Hallé, whose course had been given for the last two years by *Desgenettes*, had suggested this activity to his shy young friend Parent who had given up medical practice in despair.

1822

In 1822 Hallé died. The military surgeon, *Bertin* (1791-1828), became his successor. A rearranged medical curriculum prescribed hygiene for the second and fourth semesters.[25] A "Conseil Supérieur de Santé" was created by the central government, but remained inactive while a new "Conseil de Salubrité" in Lyon developed lustily along the lines of the Paris council.[25a] *Lachaise* (b. 1797), a former military surgeon, published a very interesting medical topography of Paris with hygienic conclusions. Beaunier's thesis on *rural hygiene* is, in spite of the fact that France was still preponderantly an agrarian country, one of the few attempts in this direction made during the period. The chemist Labarraque (1777-1850) in disinfecting intestines hit upon the "Eau de Javel," still the antiseptic of the common man in France and one of the fundamental olfactory reminiscences of everybody who ever travelled or lived in France since that time. Patissier's translation of Ramazzini's Diseases of Artisans, enriched by his own observations, was another expression of the strong contemporary interest in hygiene.[25b]

L. L. Rostan (1790-1866), regarded by his contemporaries as one of the most outstanding clinicians, the pupil of Pinel and friend of men like Chomel, Ferrus, and Georget, published for the first time his two-volume "Elementary Course in Hygiene." This book, superior to all previous attempts in the field, dealt mostly with individual hygiene. It introduced to a larger public Moreau's "physiological" classification according to organ systems.[26] Rostan was an admirer of Magendie and a bitter enemy

[24] Thouvenel 1806, p. 14.
[25] Casper 1822.
[25a] Sainte-Marie 1829.
[25b] Discussed in Rosen 1943, p. 192 ff.
[26] Principles of classification have always been of great concern to the countrymen of

of Broussais, to whose system he opposed his own system of "organicism." In spite of his opposition to Broussais, Rostan was himself not free from a certain romanticism which was perhaps an important reason for his book becoming *the fashionable text on hygiene for the next two decades.*

Quite unique is the position of Fodéré, who published in this and in the following years his monumental "Lessons on Epidemics and Public Hygiene." Though influenced by J. P. Frank, Fodéré was essentially an original thinker. He opposed Broussais no less than Sydenham's mystic notion of the epidemic "constitution." He felt that the limits of the experimental method would soon become obvious, and relied primarily on observation. On this basis he discussed the general causes of epidemics (location, food, season, contagion), devoting special attention to food, miasma, and variation in temperature. In the great controversy between the partisans of "infection" (local cause) and contagion he tried to strike a balance, classifying as contagious epidemics, typhus, plague, small pox, syphilis, etc.

1825

His *1825* "Essay on the Poverty of Nations" is a necessary complement of the earlier treatise. ("Une mauvaise distribution de toutes les parties du système social ayant toujours été une des principales causes des maladies du physique et du moral de l'homme, j'ai cru devoir faire suivre mes Leçons sur les Epidémies et l'Hygiène publique de la publication de cette ouvrage"). In 1790, J. P. Frank had been conscious of the fact that "the people's misery is the mother of disease." But Fodéré was then able, profiting by his own and the statistical work of Villermé, to become far more specific. He could point to the big factories of St. Étienne and Marseilles as the basic health hazards of the period. His statement *"La morale n'a pas marché avec les productions d'esprit,"* [27] sounds old-fashioned, but is perhaps worth our modern version that "physical science has outrun the social sciences." Fodéré dealt with the contemporary theories of the causes of pauperism: population excess, rights of inheritance, state of agriculture, industrialization, etc.; he had

Descartes. There was a lot of discussion going on in the 1820's on this subject, and Rostan, Londe, Piorry, and Rochoux adopted the new "physiological" classification according to organ systems. But in the 1840's most authors had gone back to the old Galenic classification according to the subjects (their age, sex, etc.), materials (modifying influences to which the subjects are submitted) and rules of hygiene, a classification upheld by Hallé and his pupils (Desmoulins, Deslandes, Grosourdy). See Motard (1841), Royer-Collard (1842), Michel Lévy (1844), Bourdon (1844), Foy (1845).

[27] Fodéré 1825, p. 17.

studied among others Adam Smith and Sismondi, as is already obvious from the title of his book; he discussed in particular mendicity, hospitals, and abandoned children; and asked for "une bonne économie publique dont profitent, non pas le plus petit nombre, mais tous les membres indistinctement des diverses sociétés humaines chacun suivant le rang qu'il y occupe." [28]

In this same year of 1825, Colombot, a friend of Fodéré, published a treatise on prison hygiene. The "Coup d'oeil sur les révolutions d'hygiène" of the toxicologist Desalle shows merely by its title how Cabanis' influence was still alive almost 20 years after his death. Marseilles developed a Conseil de Salubrité.

Also in 1825 appeared the "Elementary Hygiene" of *Philippe Buchez* (1796-1865) and *Ulysse Trélat* (1795-1879), psychiatrist and father of the surgeon. The book was well done and greatly influenced by Rostan; Villermé was quoted repeatedly. It dealt mostly with private hygiene, emphasized gymnastics, and occupational disease. Nobody reading it would guess that its authors founded the Carbonari movement in 1821 and escaped execution by a happy incident, that Buchez was later president of the Assemblée constituante (1848), and Trélat, one of the fathers of the second (1848) as well as the third Republic (1870). Still, Buchez's personality clearly points to one of the sources of our hygiene movement: *the socialistic ideas of important sectors of the Restoration intelligentsia.* In 1825 Buchez turned from liberalism to Saint-Simon's utopian "socialism." Saint-Simon (1760-1825) who inspired so many 19th century thinkers, bankers, statesmen, historians, etc. also influenced, as we will see, a number of medical men, and was influenced strongly by medical men. He himself tells of his indebtedness to the writings of Vicq d'Azyr, Cabanis, and Bichat, and of personal discussions with Drs. J. Burdin and Bougon. One of his closest collaborators was his physician, Dr. Bailly. This was not the first time that medicine played the role of godmother to social science. We are reminded here of Petty and Quesnay.[29] Saint-Simon's fundamental metaphor (derived from Pascal) of humanity following the same laws as man, presupposes interest in and study of physiology. This metaphor was used by St. Simon's pupils as well as by Buchez and his pupils. As a matter of fact, the science of history was to Saint-Simon only part of the science of man, which in turn was only part of the science of physiology.

Buchez broke away from the atheistic St. Simonians in 1830 and

[28] *Ibid.*, p. 21.

[29] See Ackerknecht 1932, p. 74.

founded his own school. He devoted himself more and more to the writing of history and to social reform. With Roux-Lavergne he produced the 40 volume " Parliamentary History of the French Revolution." In 1833 he published his fundamental treatise " Introduction à la Science de l'Histoire." His thought always remained colored by his medical origins (he did valuable work in neurophysiology) and Saint-Simon's influence. His numerous medical pupils (e. g. Cérise, Simon, Tessier) continued to apply his ideas to medicine and hygiene. His 1838 " Introduction à l'Étude des Sciences Médicales " contains a grandiose plan of " socialized medicine." Buchez's philosophy is a strange attempt to reconcile Christianity and Jacobinism. He remained faithful to the idea of progress, but found it best realized through Christianity. Though more rationalistic he was in many ways close to his contemporary, Lamennais. (Both men had a large popular following. To anyone familiar with 19th century French history, the strong leftist Catholicism of 1945 was nothing new.) Social scientists remember Buchez usually as the founder of production cooperatives in 1840. They are less aware that he is, besides Comte, another pupil of Saint-Simon, *one of the fathers of an independent social science*. Historians are usually strangely forgetful of his role in *inaugurating the " science " trend in history.*[80a] P. Lacombe (" De l'histoire considérée comme science," Paris, 1894), for instance, does not even mention Buchez.

1826

In 1826 the brilliant *Frédéric Bérard* (1789-1828) became professor of public and private hygiene in Montpellier.[80] His opening lecture, " On the progressive improvement of general health through civilization," was the most outspoken statement on a problem which played a great role in almost all hygienic writings of the period, and to which we will have to return later: *Does civilization improve or deteriorate health conditions?* Bérard frequently used the results of Villermé's studies, who in this same year published one of his most famous memoirs: " On Mortality in the Different Sections of Paris, Demonstrating the Relation between Poverty and Disease." Bérard, the doctor, made statements in 1826 which by many 20th century anthropologists and sociologists are thought to be rather original with them, and of very recent vintage. Bérard showed that the great difference between man and animal consists in the prolonged childhood of the former,[81] and in his ability to change

[80a] With the exception of Gooch 1935, Barner 1938, and particularly Flint 1895, Vol. I.
[80] De Saussure 1944.
[81] Bérard 1828, p. V, p. IX.

his environment.[82] He clearly pointed out that the increase in degenerative diseases is due to the increased life expectancy.[83]

Briand's "Complete Manual," of 1826, mostly devoted to private hygiene and inspired by Hallé, nevertheless showed a clear realization of the magnitude of the infant mortality problem. L. J. M. Robert's (1777-1846) "Sanitary Guide for European Governments," which dealt in particular with the prevention of yellow fever and cholera, was a valuable handbook.

1827

Charles Londe, in his "New Elements of Hygiene" of 1827, used again the "physiological" approach; but this time it was the Broussais variation with a generous sprinkling of Gall (by no means an accidental combination).[83a] The author dealt mostly with private hygiene; so did Deslandes (1797-1852) in spite of the title of his book: "Manual of Public and Private Hygiene." Deslandes also wrote on poisons, suicide, and onanism. The hygienic contribution of the famous surgeon, P. N. Gerdy (1797-1856), was of no particular interest. Neither was the thesis of Loyson except for a few remarks on prenatal care. The toxicologist, E. A. Duchesne (1804-1869), contributed a valuable study on lead poisoning. *N. Chervin* (1783-1843) started with his "Examination of the Principles of Our Sanitary Administration," an unending series of petitions, pamphlets, etc. against the "contagionist" (quarantine) policy of the government. Serious study of yellow fever in both hemispheres had convinced Chervin of the fallacy of the contagion hypothesis, and neither poverty nor persecution could stop him. Chervin devoted himself entirely to this fight, and became in this way the mouthpiece of anti-contagionism. This is a tragic life of a martyr of science, worthy of our respect regardless of the fact that his martyrdom was dedicated to a cause proved later to be scientifically wrong.

1828

In 1828 Lille and Nantes created a "Conseil de Salubrité." After Bertin's early death, *Gabriel Andral* became Professor of Hygiene and

[82] *Ibid.*, p. 14.

[83] *Ibid.*, p. 114.

[83a] Since this article was finished, O. Temkin published his excellent study on "Gall and the Phrenological Movement" in *Bull. Hist. Med.* 21 : 275 ff., 1947. A most enlightening and comprehensive discussion of the relationship Cabanis-Broussais-Gall, to which I have only alluded (see also pp. 138-139), can be found there (p. 292 ff.).

held the chair till 1830. Mongellaz, and Meirieu and Simon published on private hygiene, but interest centered around public hygiene.

Pigeotte offered an important treatise on the health conditions of the textile workers in Troyes, probably one of the earliest local studies on the morbidity of industrial workers. *Fr. Mélier* (1798-1866), later inspector-general of the sanitary services, submitted a suggestive report on the correlations between education and morality. *Villermé* continued his studies on the relation of wealth and health, and published, together with the famous naturalist *H. Milne Edwards*, a study on the mortality of newborn babies. L. Simon (1798-1867), a pupil of Buchez, later a homeopath, gave the point of view of the Saint-Simon reformers on hygiene. *J. J. Virey* (1775-1846), doctor, pharmacist, author, and deputy in 1830, dealt in his " Philosophical Hygiene " with the fundamentals of hygiene. To him the problem was primarily a social one:

L'absence ou le silence des instincts conservateurs exige la recherche des lois spéciales de l'hygiène. . . . Il nous faut un art à défaut de nature. L'homme social n'est pas un homme naturel.[84]

La liberté féconde la vie autant que l'esclavage éteint son energie et sa chaleur. Toutes choses égales, les peuples courbés sous de mauvaises lois tombent dans le marasme, subissent le plus de maladies; on les voit décimés par des funestes endemies, ou moissonés de cruelles contagions.[85]

The main subdivisions of Virey's treatise are: hygiene related to human nature, hygiene related to social and political conditions, and hygiene related to moral conditions.

1829

1829 is a year memorable in the history of French hygiene because of the foundation of a special journal that immediately acquired international reputation and is still appearing today: The *Annales d'Hygiène Publique et Médecine Légale*. As editors of the first volume signed: Adelon, Andral, Barruel, D'Arcet, Devergie, Esquirol, Kerandren, Leuret, Marc, Orfila, Parent-Duchatelet, Villermé. It was the contributions of the two latter which primarily made the journal famous. The introduction was written by *Ch. Ch. Marc*. The main subjects of public hygiene to him were: climate, salubrity, food, the health of soldiers and

[84] Virey 1828, p. V, p. IX.

[85] *Ibid.*, p. VII. This argument is probably influenced by Sismondi's historical writings. It reappears with Virchow and other German authors of 1848, see Ackerknecht 1932, p. 95, 96.

sailors. Marc entertained the same ideas on the political role of hygiene, and its dependence on general medical theories as e. g. Thouvenel or Lévy (see quotations above).

Mais elle (l'hygiène) a devant elle encore un autre avenir dans l'ordre moral. De l'investigation des habitudes, des professions, de toutes les nuances des positions sociales elle deduit des reflexions et des conseils qui ne sont pas sans action sur la force et la richesse des états.[86]

Partout on reconnait chez les hommes réunis en société une tendance à prévenir au moins une partie des causes qui compromettent la santé générale, tendance toutefois dont la direction aussi que l'énergie ont toujours été et seront toujours en rapport avec l'état des lumières qui la réglent et de l'organisation sociale qui la met en action.[87]

Marc gives a short survey of the history of public hygiene in France from De la Reynie (1668) to the Conseil de Salubrité of Paris in 1802: Modern science produces modern industry with its health hazards, but it also produces modern medicine to prevent and cure these afflictions.[88] The Germans had a better literature on public hygiene during the 18th century—Marc had studied in Germany during the revolution and was a great admirer of J. P. Frank—but more was done in France.

Etienne Sainte-Marie (1777-1829) in his " Lectures on medical police," made an excellent survey of the problems faced by the Conseil de Salubrité of Lyon in 1829: newly constructed buildings, floods, factories in the city, alcoholism, prostitution, abortion, rabies, poisoning with dyes and oysters.

It is significant that in 1829 a certain David Johnston of Edinburgh described French health regulations as superior to those in Great Britain.

1830

1830, the year of the July Revolution, offers little in our field. The famous military surgeon, *R. H. J. Scoutetten* (1799-1871), published an " Elementary Treatise " on hygiene. Troyes obtained a Conseil de Salubrité. *Follet* felt that the hygienic conditions of factory workers were worse than those of the masses of antiquity. He was against the popularization of medical (therapeutic) knowledge, but in favor of popularizing hygienic (preventive) knowledge. The following sentence of his deserves to be quoted: " *Dites que vous allez prendre un bain, et l'on vous demandra si vous êtes malade.*" [89] Bourjot's thesis on the school

[86] *Annales* I, p. V.
[87] *Ibid.*, p. XI.
[88] *Ibid.*, p. XIII.
[89] Follet 1830, p. 10.

physician reminds us of the fact that France was the first European country which, in 1833, tried (unsuccessfully) to introduce regular medical inspection of school children by administrative order.

1831

Rouen and Bordeaux obtained a Conseil de Salubrité in 1831. H. F. Gaultier de Claubry (1792-1868) searched for cheap foodstuffs for the masses. Cholera had again started its devastating course around the world from India in 1826. It reached Paris only on the night of March 26, 1832, the night of Carnaval; but as it had already invaded Russia, Germany, and England in 1831, it was but good preventive reasoning that Marc published a popular treatise on the main measures to protect oneself from cholera. This was one of the earliest of the innumerable pamphlets produced by this second of the four cholera pandemics of the 19th century. I have listed in the bibliography only some preventive treatises, preferably by men known also for other medical accomplishments like L. A. Gosse, Bouchardat, J. N. Guilbert (1778-1836) and the military surgeon, F. G. Boisseau (1791-1836).

1833

His 1833 treatise on vaccination is typical for *J. B. E. Bousquet* (1794-1872), the most active of the many protagonists of smallpox prevention in our period. *Villermé's* 1833 essay on epidemics summarized many of his earlier results and thoughts: Civilization reduces epidemics. The shift of maximum mortality from autumn to spring is significant for epidemiological changes. The poor for whom high prices mean famine, no matter whether the harvest was good or bad, are always hit hardest. Villermé proposed the introduction of the value of one working hour as a monetary unit. Against Malthus he argued that in the long run epidemics do not diminish the size of the population, but lower its quality in making three generations live the life span of one.

In 1830 France started the conquest of Algeria, and the foundation of a second colonial empire. This opened a new field for hygienists: colonial hygiene. Many treatises, on Algeria in particular and on hot climates in general, were the outcome of this new development. Herrmann's 1833 study on health and disease in Algeria seems to have been one of the earliest publications on the subject. It is well known to how large an extent the success of the French conquest was due to the expert collaboration of medical men (Maillot, Laveran, etc.)

1834

Cloutier, a military surgeon, turned towards hygiene as the only compensation for the disappointments of curative medicine. He had but a poor opinion of the hygienic accomplishments of the church and army. *J. H. Réveillé-Parise* published his famous treatise on the physiology and hygiene of intellectuals. Though the term "mental hygiene" was not as often used a hundred years ago as it is today, it should not be overlooked that occupation with these problems has a long and extensive history. *H. C. Lombard* (1803-1895), the medical geographer, contributed an interesting study on the influence of different occupations on pulmonary tuberculosis. *P. Jolly* (1790-1897), known for his many studies on detail problems (water supply, alcoholism), dealt with the sanitation of the "landes" region near Bordeaux. In 1835 C. Saucerotte (1805-1864) published his "Advice for the Hygiene of the Working Classes." The Mulhouse industrialist, A. Koechlin, made a pioneer effort to provide his workers with adequate houses. The medical travelbook of Lee of 1834 mentions again that in Paris hygiene was taught in the second and fourth semesters, and made up part of the final examination. Prosper Menière (1799-1862), of Menière's disease, gave courses in hygiene.

1836

In 1836 *A. Parent-Duchatelet*, the best known, to many the only known of the great hygienists of the period, died at the age of 45. His reputation rests mainly on his monumental treatise on *Prostitution in Paris*, published in the year of his death. The austere author, who regarded this as just another study in "sewerage," is entirely innocent of the morbid attraction his book has exerted throughout the years. A collection of 20 memoirs, the results of 15 years' work in hygiene, published by his friends in the year of his death under the title of *"Public Hygiene"* gives a clear picture of his qualities. His work is impressive by its practicability, its striving for exactness, its absolute lack of oratory (so different in this respect from the "systems" of many of his colleagues), its unwillingness to take anything for granted (therewith destroying many old legends), and by the wide range of subjects covered. Parent's main interest was sewerage in all its aspects. He was occupied a great deal with the disposal of dead horses, a big sanitary problem for every metropolis in the pre-automobile era. But he also dealt with the hygienic aspects of factories, homes for the aged, dissection rooms, food, fertilizer, and tobacco. In the almost intentional absence of any general plan or underlying idea

Parent resembles Magendie so closely that one is tempted to modify for him the self-bestowed nickname of the latter into "the scavenger of hygiene."

The chemist *J. B. A. Chevallier* (1793-1879), famous for his work on different industrial poisons and his fight against the adulteration of foodstuffs, member of the Conseil de Salubrité after 1843, published a treatise on public hygiene which contains original methods for the disinfection of fecal matter. L. A. P. Cérise (1807-1869), the best known medical pupil of Buchez, offered a manual on child hygiene.

1837

The contribution of *Fr. Ribes* (1800-1864), a partisan of St. Simon, started his career as professor of hygiene in Montpellier, and impresses us as being rather verbalistic. *Ap. Bouchardat* (1806-1886), who influenced French hygiene deeply through his etiological approach in the second half of the century (Bouchardat was one of the early and rare medical partisans of Pasteur) and won deserved fame for his work on diabetes, published a memoir on the hygienic conditions in the hospitals of Paris. L. A. Gosse contributed a treatise on prison hygiene.

1838

An 1838 doctoral dissertation of the military surgeon Bubbe-Liéven was based on ideas of Buchez and Ribes. P. Foissac (b. 1801) again emphasized the role of *gymnastics* in hygiene. Prosper Menière, J. A. R. Rochoux (1787-1852) and P. A. Piorry (1794-1879) submitted dissertations at the concours for the Paris chair of hygiene. The chair went to *H. Royer-Collard* (1802-1850), the son of the psychiatrist, son-in-law of Andral, and nephew of the politician. His thesis dealt with alcoholism.

Piorry's treatise on housing shows the great progress French scientific hygiene had made during the foregoing 20 years through the work of Villermé, Parent-Duchatelet, D'Arcet, and Marc, all quoted by the author. Piorry stated that "notre époque est marqué par une heureuse tendance vers l'hygiène publique."[40] That much still remained to be done can be seen from his remark that between 1830 and 1836 reports on no fewer than 90 epidemics had been submitted to the Academy of Medicine. Piorry, a veteran of the Napoleonic wars, is best known for his invention of the pleximeter and his clinical work.

[40] Piorry 1838, p. 93.

Esquirol's (1772-1840) famous book on mental diseases gave full attention to hygiene. This is not surprising as the hygienic interests of this great clinical psychiatrist, (co-founder of the *Annales* in 1829, since 1830 member of the Conseil de Salubrité of Paris and in 1840, its president) are well known.

F. V. Raspail (1794-1878) was primarily a chemist, a "quack" and a radical politician, but he exerted a great and salutary influence on his countrymen in promoting greater cleanliness and better industrial hygiene. His 1839 treatise on prison reform was based on extensive "inside" knowledge of the subject. *L. Tanquerel des Planches* (1809-1862) published his classic on lead poisoning. *J. F. Rameaux* of Strasbourg reviewed in a very interesting "concours" thesis the theoretical and practical progress in public hygiene during the first four decades of the 19th century. Rameaux had the large concept of public hygiene, already encountered repeatedly:

L'hygiène publique s'occupe de l'homme en société, et le considère comme espèce. Religion, gouvernement, moeurs et coutumes, institutions, relations d'homme à homme, et de peuple à peuple, tout cela est de son ressort. Elle touche, en un mot, à toutes les faces de notre existence sociale: elle fait plus encore, car elle tend, comme le voulait Cabanis, à perfectionner la nature humaine générale.[41]

The author reported theoretical and practical progress particularly in the following fields: child hygiene and vaccination, bathing (more than 4,000 public bathtubs in Paris in 1839 as compared to 500 in 1816 and 200 in 1789), prison, military, and naval hygiene, sanitary police, alcoholism. It is impressive to see that almost on any point he took up, the author felt obliged to give credit to Villermé.

1840

In 1840 Menestrel published posthumously the "Elements of Hygiene" of his friend, the ex-deputy of the Meurthe, *P. S. Thouvenel* (1782-1837) whom we know already from his 1806 doctoral thesis as an admirer of Destutt de Tracy. The book dealt primarily with private hygiene, mental and physical (a chapter on gymnastics), and contained several chapters on public hygiene.

In 1840 *Villermé* published what he always regarded as his magnum opus: his "*Survey of the Physical and Moral Conditions of the Workers Employed in the Cotton, Wool, and Silk Factories.*" The book reveals

[41] Rameaux 1839, p. 5.

incredible conditions of squalor, overwork and misery, especially among child labor. Villermé had the great satisfaction to witness that under the pressure of the alarmed public opinion a law limiting child labor was promulgated the next year (1841).

Bottex submitted an excellent plan for sanitation of the highly malarious Dombes region near Lyon. F. Leuret (1797-1851), the famous psychiatrist and friend of Parent-Duchatelet, contributed to the problems of mental hygiene.

1841

The general treatise of *L. C. A. Motard* shows great improvement when compared to similar attempts by Londe or Rostan during the 1820's. Devoted primarily to individual hygiene, it contains much public hygiene including industrial hygiene. Statistical material is abundant.

The military surgeon *Bourgeois'* "Considerations on Public Hygiene" are an excellent study on health and prevention in Beauvais (Oise). The exorbitant child mortality was probably rightly credited, following a clue of Villermé, to malaria. Drainage, sewerage, and the sanitary administration of schools, colleges, factories, and brothels were discussed. Another proof of the high standards of French hygiene in our period is the lucid and intelligent popular treatise of *Chambeyron*. The following sanitation measures for a village were proposed: river regulation, drainage of swamps, a public lavatory, a public fountain with a filtered water supply, and improved housing. In his treatise on embalming the well known chemist, J. N. Gannal (1791-1852), dealt not only with his own embalming methods, but with many other hygienic problems connected with the disposal of corpses.

1842

The study of *H. Royer-Collard* on the influence of changed diets on body size and function has a very modern ring. It is a more theoretical complement to *Fr. Mélier's* (1798-1866) work on the influence of food-supply (depending largely on grain prices) on disease and death. *L. J. S. Thillaye* (1776-1860), physician, chemist, and curator of the collections of the Paris Faculty, an old collaborator of Hallé and son of a famous surgeon, published a manual for industrialists which contains many hygienic hints.

1843

In 1843, the veteran hygienist, *J. P. J. D'Arcet* (1777-1844), published an important collection of his memoirs on sanitation in factories, public buildings, and private houses. *E. Peclet's* treatise on heat gave important

scientific foundations for proper ventilation. (Peclet was a friend of St. Simon) G. C. Poyen's thesis on public hygiene asked for the control of education by doctors, and the abolition of the "officiers de santé," thus tying up the problems of public hygiene with those of "medical reform," an organizational reform of the medical profession. The latter goal was the central motif of the psychiatrist, *L. J. F. Delasiauve* (1804-1893), who published the first of his many pamphlets in 1843 (on the reorganization of medical practice, charity, and teaching). As stated by us in 1932,[42] France had a medical reform movement in the 40's similar to those in England and Germany.[43] For obvious reasons, several of the protagonists of hygiene play a role in this medical reform movement.[44]

1844

L. Fleury (d. 1872), who taught hygiene and was obviously influenced by the sociologist A. Comte, was also one of these medical reformers. I. Bourdon's (1796-1861) "Practical Notions of Hygiene" was a short, popular compendium. Of all the systematic books of our period that of the military surgeon, *Michel Lévy* (1809-1877) on private and public hygiene is decidedly the best known. Lévy was fully conscious of the disadvantageous influences of general medical "systems" on hygiene. He tried to do for private hygiene what Parent-Duchatelet had already accomplished for public hygiene. "Il n'est qu'un moyen de soustraire l'hygiène à toute influence systématique: c'est de la circonscrire dans la limite rigoureuse des faits et de laisser au faits leurs liaisons naturelles."[45] In 1844 Firmin Marbeau founded day nurseries for the babies of working mothers.

1845

F. Foy (1793-1867), physician and pharmacist, published a good textbook for students. Sorgoni dealt with an important chapter of rural occupational hygiene: the artificial culture of rice. *Th. V. J. Roussel* (1816-1903) is still remembered for his accomplishments in parliament in 1849 and after 1874. The 1874 law for the protection of infants bears his name. He was no mean scientist either. His 1845 book on pellagra

[42] Ackerknecht 1932, p. 72, p. 117.

[43] Finkenrath 1929, Ackerknecht 1932.

[44] For French authors see my 1932 bibliography. In preparing this paper I also came across reform pamphlets or articles by Buchez, Danvin, L. Fleury, A. Fleury, Réveillé-Parise, Boudin, Anglada, Dorrion, Stoeber, Leroux, Fournier de Pescay, Gerdy, Ménestrel, Charbonnier, Loreau, Saucerotte, U. Trélat, and L. Simon.

[45] M. Lévy 1844, p. 46.

in France was an important contribution to the questions of malnutrition and nutritional hygiene. His 1846 treatise on the disease of the workers in match factories was a pioneer study on occupational phosphorus necrosis.

1846

The military surgeon, *J. Ch. M. Boudin* (1806-1867), was an authority on medical geography. A collection of his contributions to public hygiene, mainly in the fields of military hygiene, health conditions in Algeria, water supply, and pellagra, appeared in 1846. Caillet dealt with school hygiene, and *E. Séguin* (1812-1880), who settled in the United States in 1848, came out with his pioneer work on the feeble-minded. J. B. Montfalcon published, together with A. P. Polinière, a valuable treatise on the salubrity of big cities and the hygiene of Lyon.

1847

The military surgeon and anthropologist, *A. J. Périer* (1806-1868), was the author of two volumes on hygiene in Algeria. Important materials on this subject were also incorporated in the two medical volumes of the official report of scientific explorations in Algeria, published in the same year. Naval hygiene was dealt with by the navy surgeon, J. F. Fleury. *F. Mélier* discussed the necessary precautions in the salt-producing swamps. Much practical work was done in the 1840's in the sanitation of swampy regions in Algeria and the Sologne, Bresse, and Brenne in continental France.

The treatise of the psychiatrist, *P. Lucas* (1808-1883), on heredity inaugurated a new trend of emphasizing hereditary elements in hygienic reasoning. *P. A. C. Magne* (b. 1818) renewed interest in ocular hygiene.

1848

F. M. Barrier (1812-1870) brought up the problem of day-homes for babies; the great military surgeon, *C. F. Lallemand* (1790-1853), the whole problem of hygienic education; and *Ch. Dupin* dealt with child labor. Boudin and another military surgeon, *L. J. B. Bégin* (1793-1859), after 1850 president of the Conseil de Salubrité of Paris, published on military hygiene, and E. Celle on the hygiene of tropical climates.

We close this chronological survey in 1848, the year of the French and German revolutions. With the British public health law of 1848, leadership in practical hygiene clearly passed into the hands of the British. France had her first national health law, too, in 1848 (Dec. 18, 1848),

but its practical results were unsatisfactory, partly because of the political unrest of the following years. Yet it is significant that the Council of Health under whose auspices Dr. Stephen Smith entered the field of public hygiene in New York City in 1850, was still patterned after a French, not an English model.[46]

The year 1848 also brought to the foreground those forces in Germany that developed an exemplary practical public hygiene there, e. g. Virchow, and really founded an experimental hygiene, public and private (Pettenkofer). This new experimental hygiene parallels that historical phase of clinical medicine that we might call "laboratory medicine." Starting in the 1840's, "laboratory" medicine is still with us. The new experimental hygiene fully applied, like German clinical medicine of the second half of the 19th century, the great discoveries in the basic sciences of the first half of the 19th century to its own problems. The French have done excellent work in this field too (e. g. Tardieu, Bouchardat, etc.). Bacteriology, the most important creation in medicine and hygiene during the second half of the 19th century, is largely a French discovery; yet, as in clinical medicine, France has never been able to recapture her leading position. The movement, briefly described by us above, is contemporary, and in its virtue and limitations is akin to the great French clinical movement of the first half of the 19th century ("hospital medicine")—it is more than an accident that men like Andral, Piorry, Rostand, Esquirol and Leuret played an important role in it.

Discussion

About one third of the literature reviewed above is of a general nature. Most of the general treatises were written either in the 1820's or in the 1840's. In the 1820's, generalizing was largely a result of the tradition of *Hallé and the ideologists,* and of the influence of *Broussais* on the other hand. Because Broussais does not mean much to us today, we tend to underestimate his deep and long-lasting impression on French medicine. This is not the place to reopen the case of Broussais in detail. Yet, we would like at least to point out that we tend today to view Broussais too exclusively from the angle of the Laennec-Louis-Broussais controversy. To his contemporaries, Broussais was more than the inventor of "irritation"; he was, among other things, the heir of Bichat, the prophet of "*physiology,*" the catchword of the period (perhaps even more among the laity—Saint Simon, Balzac—than the profession). The old republican

[46] Smith in Ravenel 1921, p. 5.

was beloved as the lonely defender of Condillac-Cabanis' sensualism-materialism against the spirtualism of the Bourbon reaction. An additional reason for Broussais' influence on hygiene was that most of the numerous military surgeons whom we encountered in this chapter of French hygiene were loyally devoted to their old comrade in arms. (Michel Lévy's 1844 treatise, e. g., in spirit so different from Broussais, was still dedicated to him). The general treatises of the 1840's had a different, less philosophical, more practical tenor. The following criticism of Bouchardat is mostly directed against the general treatises of the 1820's:

Si au commencement de ce siècle on s'efforcait de tout comprendre dans l'hygiène, aujourd'hui il faut laisser dans l'ombre une foule de détails, ou oiseux ou qui ne peuvent se prouver. . . . Avant la phase nouvelle dans laquelle est entré l'hygiène, tous les auteurs cherchaient à agrandir son cadre. On s'efforcait de faire un inventaire général des connaissances humaines dans leurs rapports avec l'hygiène. Le programme était infini, il était formé d'un assemblage de lambeaux empruntés à toutes les sciences et particulièrement à la physique, dont l'enseignement a été longtemps confondu chez nous avec celui de l'hygiène. On reconnait encore la trace de cette fusion dans les ouvrages modernes.[47]

Those who share Bouchardat's criticism (I do so only to a very limited extent) might console themselves with the fact that the remaining two thirds of the work done between 1815 and 1848, that dealt with detailed problems of personal and public hygiene, would alone be sufficient to justify our appreciation of the period. Let us as an illustration give only a few examples of such outstanding detailed work (in omitting such obvious and bulky items as epidemiology of cholera and yellow fever, or Algeria):

Vital Statistics: The work of Benoiston de Chateauneuf, Villermé, Mélier.

Vaccination: Fiard, Bousquet, Gaultier de Claubry, Marc.

Gymnastics: Friedlaender, Londe, Lachaise, Pravaz, Foissac.

Military and Naval Hygiene: Boudin, Kerandren, Forget.

Industrial Poisons: Tanquerel des Planches, Chevallier, Roussel, Sédillot.

Industrial Hygiene: Pigeotte, Saucerotte, Villermé, Benoiston de Chateauneuf, Lombard.

Health Problems of the Big City (*Water Supply, Sewerage, Buildings, etc.*): Lachaise, Parent-Duchatelet, Piorry, D'Arcet.

[47] Bouchardat 1867, p. 5.

Local Studies: Bottex, Bourgeois, Chambeyron, Montfalcon and Polinière, Jolly.

One cannot help feeling that occupation with hygiene had almost become a fashion in our period. It was, perhaps, the very general character of hygiene, the inclusion of whatever physiology existed at the time, which induced many young men to start their lifework in hygiene. This general character made hygiene attractive to many who regarded it as the "philosophical" foundation of medicine (e. g. Follet, R. Fleury).

The most successful combination of detail work, specialized method, and general meaningfulness, was probably achieved in the work of Villermé. If we want to single out a "hero" for our period, Villermé probably deserves this position more than anyone else. We have mentioned above repeatedly the influence he exerted on his French contemporaries. This influence can be traced easily far beyond the French frontier, e. g. in such important men as Casper,[48] or Southwood Smith.[49] Villermé's work transcended far beyond the inquiries into the situation of factory workers for which he is known. Not only had he developed for the latter positive hygienic goals (insurance associations), but his work which he himself called "medical or hygienic statistics"[50] dealt with all aspects of vital statistics. It preceded the better known work of his friend, Quetelet, while it is preceded by the work of Fodéré and Benoiston de Chateauneuf.

Villermé's statistical research on increasing life expectancy strongly influenced the decision of many in regard to a problem which puzzled hygienists greatly in the 1820's: *Does civilization produce or reduce disease?* For the older hygienists, the school of Tourtelle and Hallé[51] that had grown up in the shadow of Rousseau, whose "Émile" had stimulated hygiene so tremendously, it was self-evident that civilization breeds disease. Villermé, the Dante of the hell of the French cotton mills, and those who followed him[52] were certainly well aware of the terrific effects of some aspects of our civilization on health conditions. Yet, "La civilsation fait gagner à la santé publique beaucoup plus qu'elle ne lui fait perdre sous certains rapports."[53] To decide the problem in this direction was—quite apart from the objective data on which the

[48] Casper 1835, II, p. 174.
[49] Southwood Smith 1847.
[50] Villermé 1829.
[51] Desmoulins 1818, Villevert 1818, Virey 1828, p. I.
[52] Rostan 1822, Fodéré 1822, Bérard 1826, Marc 1829, Rameaux 1839, M. Lévy 1844. For a late echo of this discussion in Germany, see C. F. H. Marx, 1844.
[53] Bérard 1826, p. 6.

decision was based—a fundamental, internal necessity for those who started an epoch of sanitary *reforms* in a growing industrial society which obviously could never go back to nature again. Continuation of the Rousseau attitude would have deprived their work of its sense. This was a generation that strongly believed in "Progress" (see e. g. Bérard, Buchez, Rameaux, Michel Lévy, Tardieu). To credit civilization with the increase of disease was inconsistent with such a "Weltanschauung."[53a]

A similar internal necessity led to the discovery that *not primarily climatic, but to a large extent social factors are the basic element in the causation of disease,* especially epidemics. The protagonist of "climatism" in the 18th century had been Montesquieu, and the opposition of Volney and Helvetius had not affected his influence. Cabanis and Hallé followed Montesquieu. We have already quoted Virey (1828—he gives as example the changing history of disease in a climatically unchanged Rome, an example, which is a stereotype with all anticlimatists) and Fodéré (1825) for strong emphasis on the social element vs. climatic factors. Villermé wrote in 1829: "*On attribue beaucoup trop souvent les caractères qui distinguent les peuples entre eux, et les chances très différentes de vie qu'ont les masses d'individus qui composent chaque nation, à la différence du climat.*"[54] The same point of view was adopted by Buchez-Trélat (1825), Esquirol (1838), and Rameaux (1839). We thus see an idea which is generally credited to Virchow,[55] expressed in France even earlier than either by Virchow himself (1848-1849) or by Englishmen who are known to have influenced Virchow like Alison (1843), Cowan (1838), or Davidson (1841).

This is not the only fundamental idea which, under the name of Virchow, circled the globe after 1848, and which, decades earlier, we find looming large in French hygienic literature.[56] Two of the many "social" statements that Virchow and his friends, S. Neumann, Leubuscher, etc.[57]

[53a] The wonderful continuity of French thought makes this discussion almost a continuation of the 17th century "querelle des anciens et modernes."

[54] Villermé 1829, p. 6.

[55] Ackerknecht 1932, p. 150. It is also noteworthy that in 1848 Virchow was full of praise for French techniques of cholera prevention (1879, vol. I, p. 24) and that his 1848 report on the typhus in Upper Silesia is clearly modelled in many parts after the 1846 report of C. R. Prus on the plague in Egypt.

[56] As a matter of fact, my acquaintance with this literature is the incidental by-product of a study on "Rudolf Virchow, pathologist, anthropologist, citizen" in which I am engaged at present. I intend to reexamine the life and work of Virchow beyond the fragmentary contributions which I made in my 1932 thesis and in a study written in 1946 for *Ciba Symposia* on "Doctors as Statesmen and Politicians."

[57] For more data see Ackerknecht 1932.

made in 1848 have been quoted again and again by influential friends and admirers of Virchow as e. g. Abraham Jacobi [58] in this country:

The physicians are the natural attorneys of the poor, and the social problems should largely be solved by them.[59]

Medicine is a social science, and politics is nothing else but medicine on a large scale.[60]

We have already quoted Thouvenel (1806), Letourneur (1821), Marc (1829), Rameaux (1839), Poyen (1843) who express the same underlying idea in slightly different terms: that *the doctor is fundamentally best qualified to find the solutions to society's basic problems.* We might add that Fodéré, in 1825, after having stated, " Il est dans le monde trois professions auxquelles cette solution (du problème de la pauvreté) semble spécialement réservé: les hommes d'État, les légistes, et les médecins " adds that fundamentally only the latter are able to solve the problem.[61] This " imperialistic " attitude of the medical men reached its peak in Menessier's (1850) claim that the doctor should not only supervise and advise the internal, but also the foreign policy of the country (médecine sociale intérieure et médecine internationale).[62] It shows the undeveloped state of the social sciences of the period in that they could still be claimed as part of medicine. This belief must have been very reassuring to the many doctors active in politics during this period.

The basic justification for these somewhat exaggerated notions lies in Cabanis' thesis of the relations of the physical and the moral aspects which was upheld by early authors like Tourtelle (1797), Hallé (1818), Compère (1818) as well as by Rameaux (1839), Villermé (1840), Bourgeois (1841), Cérise (1842), and Réveillé-Parise (1843). To quote the latter:

L'anatomie et la physiologie sont les deux premiers chapitres d'un cours complet de bonne philosophie. C'est dans les entrailles mêmes de l'homme qu'on apprend à le connaitre, à le voir tel qu'il est, tel que Dieu l'a fait. De cette manière on peut entrer dans le domaine de la métaphysique par le chemin de l'observation. Pour bien connaitre l'entendement humain, commencez par en connaître les instruments, par en apprécier la force, l'action et l'influence. Sachez jusqu'à quel point les lois de l'organization régissent l'homme, déterminent ses besoins, développent ses

[58] Abraham Jacobi 1909, vol. VII, pp. 261, 264, 271.
[59] Originally published in 1848; reprinted in Virchow 1879, I, p. 4.
[60] Originally published in 1848; reprinted in Virchow 1879, I, p. 34.
[61] Fodéré 1825, p. III. See also Temkin 1946, p. 18 on the " customary dealing of medical scientists with psychological and sociological questions."
[62] Menessier 1850, p. 37-38.

facultés, font éclore ses passions. On a dit que nos erreurs en morale, n'étaient souvent que des erreurs en physiologie, cela est vrai.[63]

And in 1852, A. A. Tardieu started his Dictionary of Public Hygiene with a statement still based on the same philosophy:

Les conditions matérielles de la vie exercent sur les dispositions morales de l'homme une influence si évidente, si directe que les efforts d'une société bien constituée doivent tendre constamment à améliorer l'état physique du plus grand nombre de ses membres.[64]

To us this idea has either become self-evident, or we omit its discussion because we no longer feel the urge for a philosophical foundation for our activities.

It is no accident that such ideas about the omnipotence of medicine should crop up in France where 200 years earlier Descartes had written: "car même l'esprit dépend si fort du temperament et de la disposition des organes du corps, que, s'il est possible de trouver quelque moyen qui rende communément les hommes plus sages et plus habiles qu'ils n'ont été jusqu'ici, je crois que c'est dans la médecine qu'on doit le chercher." This dream of Descartes or Cabanis to base a science of man, an "anthropology," on medicine (of which hygiene is an essential part) was consciously taken up in the period under discussion, e. g. by Fodéré (1823), Rostan (1822), Virey (1828), or Réveillé-Parise (1843). And so it was with Virchow in 1848 (e. g. see *Archiv*, vol. II, p. 36)! In 1888, Bertin-Sans still flatly claimed: "*L'hygiène ne vise à rien moins qu'à formuler les lois générales de la civilisation.*" Both fields: medicine-hygiene and the social sciences were sufficiently dynamic and immature at the time to cross-fertilize each other, perhaps more than in any other period of their history. Saint-Simon adopted physiology as the basis of social science; Cabanis' specific "physiological" development of Condillac's sensualism provided the philosophical justification for the sociological excursions of our hygienists. It was, on the other hand, through sociologically interested medical men like Villermé that mathematic and statistical methods, already applied by social scientists like Saint-Pierre and Condorcet,[64a] gained a foothold in medicine, where they were to play an ever increasing role.

[63] Réveillé-Parise 1834, I, p. 22.

[64] Tardieu 1852, I, p. III.

[64a] I am indebted to Prof. H. H. Gerth for having drawn my attention to the different approaches of Cabanis and Condorcet in spite of their friendship and their common roots in Condillac.

It is impossible, within the limits of this article, to go beyond the discussion of such very general problems as those discussed above: It might be useful to conclude with an examination of the twofold problem of the movement itself; that is, *Why on the one hand it reached such proportions, and why on the other it was overlooked or forgotten to such an extent.*

The first part of the question seems not too difficult to answer. During and because of the Napoleonic wars, France had gradually developed a sizable industry, and was now faced by many health problems that England had already encountered in the second half of the 18th century. The practical experiences and the many international contacts made during the Napoleonic wars had created mental alertness for hygienic problems, particularly the hygienic problems of the community. This trend could only be reinforced through the fact that *just during this period France was undoubtedly the most advanced country in the field of social theory.* This was the age of men like Saint-Simon, Comte, J. B. Say, Sismondi, A. Thierry, Guizot, Fourier, Cabet, Lamennais, Buchez, Considérant, Louis Blanc, and Proudhon. Furthermore, if the solutions for the ills of society were to be found in hygiene and medicine, then in a period of unrest, this field was bound to attract a great number of active personalities.

In the field of medicine proper we have already mentioned the general upswing of clinical medicine which could not but affect hygiene. H. Baas [65] explains more specifically the movement for prevention as a compensation for the prevailing therapeutic nihilism of the clinicians. We can accept the latter statement only as a partial explanation. It cannot be overlooked that an even more outspoken therapeutic nihilism in Austria did not produce such results. It must, on the other hand, be admitted that there is quite some evidence in favor of Baas' hypothesis. It is known that such outstanding hygienists as Parent-Duchatelet and Villermé had given up medical practice in despair. The same is reported for Thouvenel, or Cloutier. Michel Lévy writes in 1844: " La thérapeutique puise dans l'hygiène plus de ressources que dans l'arsénal pharmaceutique." [66]

But why was this movement overlooked or forgotten? Here we must remind our readers again that the history of hygiene in general has so far been the stepchild of medical historians, and *all* its phases are little known as compared to those of clinical medicine or scientific discovery in general. The extraordinary brilliancy of the bacteriological era has

[65] Baas 1876, p. 713.

[66] M. Lévy 1844, I, p. 5.

furthermore obscured everything lying behind it in the field, and in view of the situation during the late 19th and early 20th centuries it was but natural not to suspect France of any outstanding earlier record in hygiene.

There also exist some more specific reasons that were not conducive to preserving the memory of our 1815-1848 hygienists. Historians are more apt to remember those men who are akin to them, rather than those who show what are for the contemporary historian, embarrassing " contradictions." This holds true especially for the 19th century where such contradictions cannot be easily overlooked and therefore be forgiven. Now, it must be admitted that most of our authors were, like most outstanding medical men of their period, *anticontagionists*. Truly wise men like Welch have seen the good reasons for, and sometimes even the practical superiority of this attitude.[67] But after the discoveries of bacteriology only men like Bouillaud or Magendie, Virchow or Pettenkofer, who had other contributions of strong contemporary appeal to their credit, could survive this error, and would not slip from the memory of the average historian.

Modern historians have also felt little attracted by old-fashioned religiosity. Yet it must be admitted that such outstanding figures of our movement, like Hallé, Fodéré, Thouvenel, Buchez, Bérard, Parent-Duchatelet were *pious Christians*.

None of our " heroes " was a spectacular personality like Pettenkofer or Edwin Chadwick. Some of the best were even unusually shy like Parent-Duchatelet, who at a great reception confessed to a friend how much better he would feel if he could crawl around alone in one of his fascinating sewers; or like Villermé who, after the death of his wife, passed the last 12 years of his life practically isolated from the world.

Perhaps our movement was also less obvious because, different from other hygiene movements, it was *primarily* carried by doctors who are, in general, inferior to e. g. lawyers in their rhetoric and demagogic abilities. But this should be one more reason for us to honor their memory.

[67] Welch 1925, p. 28. One needs but to read the following quotation from Chervin in order to understand Welch's stand: " Si l'Espagne et les États Unis d'Amérique avaient employé à l'assainissement de leurs villes qui ont été le théâtre de la fièvre jaune la dixième partie de ce qu'ils ont dépensé en quarantaines, elles en auraient sans doute fait disparaitre, depuis longtemps, les causes matérielles et patentes de cette fatale maladie." (Chervin 1833, p. 66)

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THE USE OF ELECTRICITY IN PSYCHIATRIC TREATMENT DURING THE NINETEENTH CENTURY

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Within the last decade contemporary medical electrotherapy has been augmented by the technic of the electrical production of convulsive and other abnormal neurophysiologic and psychologic reactions as a method of treatment for the psychiatric patient. The development of the recent electroshock methods has been detailed by the writer (50) and by other investigators, but a searching historical evaluation of the use of electricity in psychiatry has not yet been made. Perhaps the closest approximations to such a study are the descriptions of the history of electrotherapy in general medicine in the writings of Cutter (21) and, especially, of Krusen (38). These authors, however, scarcely mention the special applications which psychiatrists of other periods made of the electric current in the treatment of the psychologically disordered patient. The nineteenth century, particularly, was marked by an extensive use in psychiatry of galvanic and faradic currents as treatment methods. In 1939 Berkwitz (15), for example, in discussing his use of faradic shock as a modification of electric convulsive therapy, cites several workers in the nineteenth century who used electricity in the treatment of mental disorders and remarks that the therapeutic effects obtained at that time compare favorably with the results of contemporary electroshock procedures.

The history of electrical treatment in general medicine usually refers to Galen's (131-201 A. D.) early use of shocks from the electrical fish to aid gout and other diseases, a treatment surviving into the last century among certain west coast African Negroes, and to the faith of Paracelsus (1493-1541) in the disease-ameliorating powers of the magnet. Earlier, in ancient times, Pliny and Dioscorides had referred to electricity as a powerful therapeutic agent, and, curiously, Dioscorides is said to have remedied a prolapsed rectum by its use. In England, Dr. William Gilbert, court physician to Queen Elizabeth and to James the First, apparently never made any significant therapeutic use of magnetic electricity, but the publication in 1600 of his experiments with the "loadestone" earned him the title of the "First Electrician." Sixty years after the appearance of Gilbert's *De Magnete*, Otto von Guericke was producing static elec-

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tricity by rotating sulfur against the friction of his hand, and in 1745 Ewald von Kleist constructed the first electrical condenser, an achievement independently duplicated the following year in Leyden by Pieter van Musschenbroek. Ten years later Richard Lovett claimed to be successfully treating mental disease by electric sparks and current, and John Wesley, the leader of the eighteenth century Methodist reformation, was so impressed by Lovett's electrical treatment that he enthusiastically observed in 1759 that " I doubt not but more nervous disorders would be cured in one year by this single remedy than the whole English Materia Medica will cure by the end of the century (57)." However, Christian Kratzenstein was probably the first physician to use the electricity from the Leyden jar for therapeutic purposes in general medicine, and he is also usually given credit for the publication in 1745 of probably the first book on the uses of electricity in medicine, although Johann Krueger, the professor of medicine in Halle, was employing a primitive electrotherapy at least as early as 1744. Benjamin Franklin, too, as is well known, treated various diseases with charges from the Leyden jar, and he made the observation, significant from the psychiatric viewpoint, that in treating people suffering from various symptoms of paralysis whatever improvement occurred had already been quite evident by the fifth day of treatment, thus implicitly underlining the suggestive value of the electrical procedures.

Three years before Galvani published his researches in 1786, the denunciatory and individualistic French revolutionary, Jean-Paul Marat, in his *Mémoires sur l'Électricité Médicale*, stressed insistently an admonition about the use of electrotherapy which could be quite aptly employed against the current tendency to be often uncritical in the prescription of electroshock therapy. In 1783 Marat cautioned that " It is not sufficient to know how to turn the handle of an electric machine, but necessary to know the mechanism of what one is employing as well." Nevertheless, the early part of the nineteenth century witnessed a widespread irrational use of galvanism and of static electricity which continued until the middle of the century when Duchenne and Remak, following Faraday's description in 1831 of electromagnetism and the subsequent introduction of the induced current, reëstablished the medical use of electricity on a more rational basis.

Alessandro Volta had produced the first battery about 1799, and in 1801 Bischoff (18) claimed to have cured hysterical paralysis and stupor by the application of the direct continuous current. In the same year Augustin (8) stressed the observation that the sleep of patients improved after galvanic treatment, and three years later Aldini (1) wrote that he

had cured two sufferers from melancholia by the employment of galvanism. Heinroth, in his *Lehrbuch der Störungen des Seelenlebens*, published in Leipzig in 1818, referred to the "elementary stimulation" treatment methods of "air, sunshine, warm and cold baths" and to "electricity and galvanism." Heinroth reported that Perfect, Birch, and Wohlrab had all treated cases of melancholia successfully by electricity. Reil is described as having been uncertain about the therapeutic efficacy of galvanism in the treatment of "Blödsinn." These are reports of apparently the first use in psychiatry of galvanic electricity, that is, of a continuous electric current of at least potentially significant capacity to be of general neurophysiologic importance.

At the beginning of the nineteenth century, however, the therapeutic use of electricity was contaminated by the prevailing ideas about animal magnetism, and the legitimate medicine of the time made very little use of electrotherapy until after the beginning of the last half of the century. There were, of course, evidences of the scattered use of electricity in the neurologic and psychiatric treatment of the first half of the period, largely in France and Italy. Hermel (34), for example, employed galvanic "electro-puncture" in 1844 for the treatment of sciatic and lumbo-sacral neuralgia, using two needles for electrodes and placing the positive needle-pole over the site of the pain. However, the method of galvanic "acupuncture" was at that time a more common electrotherapeutic procedure in Italy than it was in France, and it was used, as Milani (34) and Matteucci (42) reported, in the treatment of neurological diseases such as chorea, the various neuralgias, and paralysis. Earlier, in 1820, Magendie, in France, and Purkinje had also employed galvanic current to treat neuralgia, cardialgia, and epilepsy. Teilleux (52) in 1845 applied the current from galvanic cells and from the Leyden jar to idiots and imbeciles, some of whom were epileptic. In the previous century, of course, chorea and epilepsy had also been treated with pre-galvanic electricity by Cavallo in 1780, and in Germany in 1750, epilepsy became the electrotherapeutic concern of Lindhult and Lorenz Spengler. In 1844 Longet and Matteucci (40) were studying the electrically induced contractions of muscles, as Christian Kratzenstein and Jean Jallabert had done a century earlier. Three years later, in 1847, Mayer had published in the *Archiv für Physiologische Heilkunde* observations of the effects of electromagnetic current on the heart. In another area of research, du Bois-Reymond, of course, had begun in 1843 his long series of classic experiments on the electrical activity of living tissues and, particularly, of nerve-muscle preparations. More pertinently to psychiatric interest, Berlie

(17) was mentioning in 1849 that Bucknill in England was treating melancholia with potassium iodide and galvanic electricity, one of the few evidences of reputable psychiatric interest in electrotherapy during the first half of the nineteenth century.

In contrast to the skeptical rejection of electrotherapeutic procedures by early nineteenth century medicine, however, the practical and theoretic activity in the field of electrophysics was most intense and productive. Within the first few decades of the century Henry Cavendish had extended the one fluid theory of electricity postulated in the previous century by Benjamin Franklin and William Watson, and Coulomb had put forth the two fluid theory. Faraday had described his work on electrostatics and Siméon Poisson had supplied these descriptions with the necessary mathematics. Cruickshank and Humphrey Davy had evolved theories of electrolytic action, which were followed by Faraday's laws of electrolysis (1833) and his introduction of the terms anode and cathode. Oersted and Ampère were studying magnetic field currents and electrodynamics. Seebeck was writing about thermo-electricity, and Georg Ohm was concerned with the flow of electricity through conducting wires. Meanwhile, Daniell had solved the polarization problem of Volta's pile, and von Bunsen had modified Grove's cell and was producing batteries with an electromotive force of nearly two volts. After 1831 Ruhmkorff introduced an induction coil, following which the faradic current became generally available for practical use.

The French physician, Guillaume Duchenne, was most probably the first to use faradic current in medical research and treatment. In 1849 Duchenne (23) had read a paper before the Académie des Sciences de Paris in which he had discussed the effects of the galvanic current on the contractility and sensation of the paralyzed upper arms of his patients, and in the following year he was able to compare the relative merits of faradic and galvanic currents in reference to a presumed differential effect upon muscular contraction and sensation. In the 1849 paper he distinguished two classes of muscular paralysis, one of which was comprised by a group of patients in whom both contractility and sensation were diminished or abolished and the other was a group composed of those who evidenced an intact contractility but whose sensory reaction to electricity was either normal, increased, diminished, or completely abolished. On this basis he described hysterical paralysis as being characterized by an intact electrical contractility and a generally diminished or abolished sensory appreciation of electrical stimuli. He also observed that voluntary movement might be completely restored in spite of the persistence of the anesthesia to the galvanic or faradic stimulation.

Although Duchenne originally worked with galvanic current, he came increasingly to favor faradic stimulation, especially for the excitation of muscular contractions. Nevertheless, the first results of his work were to stimulate in French medicine renewed interest in galvanism. Referring to Duchenne's experiments, Récamier (46) in 1851 was reporting successfully improved cases of obstinate constipation, abdominal pain, and neuralgia by the use of " cataplasmes galvaniques." A case of " idiopathic paralysis " was cured by electricity on the service of Briquet in l'Hôpital de la Charité, and Brochin and Brierre de Boismont were soon using Duchenne's method of the electrical differential diagnosis of forms of paralysis.

The attention to electrically produced muscular contractions led Duchenne to establish optimal or " motor " points for electrode placement, a task to which Remak also made important contributions. Remak, in fact, did for German medicine very much what Duchenne did for medical electrotherapy in France, namely, reëstablished research in electrotherapy and electrodiagnostics as a valid scientific medical interest. Remak began to publish the results of his experimentation about 1855, but his *Galvanotherapie* appeared first in 1858. In contrast to Duchenne and the French medical scientists, Remak and his German associates favored the use of the galvanic current and tended to avoid a therapeutic application of faradic electricity.

Moritz Meyer, too, played a significant role in the revival at this time of interest in the application of electricity in medicine. His *Die Electricität in ihrer Anwendung auf practische Medicin* was published in 1854 and had gone through three editions by 1868, the year in which Benedikt's *Electrotherapie* was printed in Vienna. Hammond later translated Meyer's work into English and this was published in New York in 1869. By the publication in Leipzig in 1868 of *Untersuchungen und Beobachtungen auf dem Gebiete der Elektrotherapie,* Brenner also aided considerably in placing Germany into the leading position in electrotherapeutic research and application during the last half of the nineteenth century. Brenner enunciated a theory of the therapeutic effect of electricity which was particularly useful in explaining and guiding the psychiatric utilization of electric current, and some of his experiments provided the stimulus for a good deal of subsequent study of auditory hallucination. In the following years to the end of the century Germany's first place in medical electricity was maintained by Erb's *Handbuch der Elektrotherapie* and Ziemssen's *Elektricität in der Medicin.*

French and Italian psychiatrists, however, were very active in the study of the use of electricity during the electrotherapeutic renascence of

the late mid-century. Auzouy (9), in 1859, stressed indifference to pain and general insensibility of the skin as characteristics of many mental patients, and he felt that electricity restored sensory attention to pain, reestablished the action of the skin in transmitting impressions to the brain, and energized the muscle system. He also pointed out the value of the electric current as a diagnostic and prognostic weapon to determine to what extent the patient was capable of an appreciation of external stimulation and what the state of development of his intelligence might be as evidenced by his reaction to electricity. Auzouy's conceptions were thus very like the ideas which Pierre Janet much later put forth in his theory of "treatment by excitation" to stimulate the "lowered psychologic tension" of psychiatric patients. In keeping with the already existing therapeutic conceptions of the nineteenth century, Auzouy considered the application of electricity to be analogous to the use of sinapisms, common at that time, in stimulating the surface of the body. Auzouy had no doubts about the value of electricity to "excite" and to compel reality-interest. "Dans les cas," he writes, "où la folie s'accompagne de dépression, où elle se manifeste avec de l'apathie, de la stupeur, l'électrisation devient quelquefois, entre les mains du practicien, un remède héroique."

In the same year Teilleux (52) also considered that electricity was an "excitant" and hence chose for treatment psychologic states characterized by "atonie." For the greatest stimulating value he preferred to use the faradic current and, like Berkwitz (16) almost a hundred years later, he observed that most patients had a significant acceleration of pulse and that some patients, although not greatly improved psychopathologically, were, nevertheless, made much more tractable. It is of incidental interest that in the eighteenth century the Benedictine monk, Gordon, had also observed an acceleration of pulse after subjection of individuals to applications of "electric sparks." From the diagnostic categories of his time Teilleux selected for treatment lypemania, stupors, and dementia, and he found that stupors, particularly, were favorably influenced. This opinion was confirmed by an Italian contemporary, Schivardi (49), who reported the successful treatment by electricity of "melancholic stupor and immobility." Schivardi's patient was described as speaking after the first treatment for the first time during his illness. For Teilleux a treatment course consisted of 35 to 40 days of a 5 to 7 minute application of the current. Teilleux reported also that menstruation, long suppressed, returned in one case following treatment, an observation which was rather frequently confirmed in later records of other investigators and which was antedated by the work of Johannes Birch in the previous century, who

specifically treated menstrual disorders by electricity. Summarizing his experience with faradic current, Teilleux wrote " . . . il stimule, il tonifie, il modifie l'action nerveuse et le courant circulatoire. Il calme et atténue l'agitation quand il est appliqué d'une façon particulière et dans des circonstances données." Teilleux stressed, therefore, not only the " excitant " effect of electricity but also recorded observations on the sedative and agitation-suppressing value of the treatment. Augustin in 1801 had, it will be recalled, referred to the sedative and sleep-improving effects of galvanism.

Brenner (20) in 1868 developed a theory and provided an experimental basis for the explanation of the antithetical calming and exciting effects of electricity, which were observed by Teilleux and others when current was applied to psychiatric patients. In Brenner's experiments it was found that the sensation of hearing was elicited by the " make " of the galvanic current only when the cathode was placed in or near the ear and that an effective auditory stimulation on the " break " of the current could be produced only by applying the anode at similar sites. What Brenner was actually demonstrating were the facts of galvanic electrophysiology that the " make " stimuli arise at the cathode and the " break " stimuli, at the anode. Brenner, however, apparently fixing his attention on the " making " of the current, concluded that the cathode produced an " exciting " effect and that the anode was " calming." In nineteenth century electrotherapy these conclusions were referred to as Brenner's " electronic " theory. A more accurate designation might have been an " electrodic " theory.

Shortly after the enunciation of Brenner's theory there was a considerable attempt to explain the various and varying reactions of psychiatric patients to electricity as being due to the direction of current flow. Whatever actual differences were observed in the results following the application of a " descending " or of an " ascending " current did depend, of course, upon the same electrophysiological principles which accounted for the differences in stimulus-value of anode and cathode as described in the theory of Brenner. By 1878, Arndt (7), perhaps the most important figure in German psychiatric electrotherapy of the last half of the nineteenth century, had combined these two theories of current-direction and electrode-effect in his conclusions that depressive and paralyzed conditions should be treated by an ascending galvanic stream because of the " cathode-effect " and that manic conditions, and other excitements generally, should be subjected to the influence of the descending current for

the "anode-effect," thus stressing in each instance the presumed differential effect of the cephalad electrode.[1]

Not long afterwards, the Norwegian, Engelskjön (26), published his belief that the direction of current flow was of no consequence in obtaining electrotherapeutic results. Instead, Engelskjön elaborated upon the indications for the differential use of the two commonly employed forms of electricity of the time, the continuous or galvanic current and the interrupted or faradic stream.

That patients tended to give a different reaction to faradic than to galvanic electricity had been a rather common observation from the time of the introduction of faradic current. Probably depending upon the duration of each individual "break," faradic current is capable of producing considerable pain, and this pain-evoking quality may very reasonably have been the basis for Arndt and others to think of faradic electricity as being essentially a "Reizmittel" and to place it in the same category as cold baths and douches and to use it for patients seeming to need strong stimulation. Arndt, for example, recommended faradism for stupors and stuporous conditions, for long chronic illnesses, and also for hysterical symptoms. Like Auzouy, a few decades earlier, Arndt used the faradic current to act on the skin, and he also felt that electrical stimulation of the phrenic nerve was useful in accelerating the circulation, in decarbonizing the blood, and in combating passive hyperemia, all of which was considered as the assumed physiopathology of some forms of mental disorder.

Engelskjön attempted to put the choice of the kind of current upon the basis of knowledge derived from his experiments on the vasomotor effect of the two currents and on their effect on the visual fields. He insisted that the diseases benefiting from galvanism were characterized by an actively dilated vascular system, and those illnesses improved by faradism were marked by spastically contracted vessels. Engelskjön (25) felt that his experiments indicated that the faradic current dilated constricted vessels and that the galvanic application constricted dilated blood vessels. In order to explain his observations, he postulated a differential effect of the two currents upon the local ganglia of the vascular nervous supply. He also recorded that the faradic current increased body temperature in contrast to the thermal decrease produced by galvanism. His

[1] In his *Lehrbuch der Störungen des Seelenlebens*, Leipzig, 1818, Heinroth had already refuted as erroneous the contention of Bertholon de St. Lazare that for mania negative electricity should be used, and that asthenia and dementia should be treated by positive electricity. Heinroth denied the differential effect and insisted that the negative pole stimulated as powerfully as the positive.

results of the effect of electrical stimulation on the visual fields were inconstant, but he felt that whatever type of current "dilated" the visual field was the current of choice for therapeutic application. Constriction of the visual field after faradic or galvanic stimulation indicated a bad prognostic result for treatment by the constricting current of the psychiatric or psychosomatic disorder from which the individual was suffering.

It is of more than passing interest to the current study of cerebral vasodynamics that Engelskjön treated hemicrania by electricity and based his selection of the kind of effective current upon his consideration that there were two essential forms of hemicrania, one being a disease of vasoconstriction and the other, a headache caused by vasodilatation. Faradic current was used as an anti-vasoconstrictor, and galvanic electricity was employed to constrict the pain-producing assumed vasodilatation. Indirect support for this rationalization of the electric therapy of hemicrania was derived from Engelskjön's experience that those cases of hemicrania relieved by the inhalation of amyl nitrite also derived benefit from faradic current.

Another rather interesting incidental observation of Engelskjön was his description of an "electrical neurosis," characterized by sleeplessness, depressed mood, restless malaise, and abnormal limb sensations. These symptoms developed after a few weeks' subjection to electrotherapeutic procedures. The "electrical neurosis" developed with improvement of the illness, and Engelskjön assumed that since a psychiatric illness included the functions of both abnormal and normal nerve cells, the electricity made the abnormal cells less pathological, but it tended also to create a pathologic condition of the normal neurons. In 1940 Berkwitz (1) observed that patients subjected to faradic shock tended to be restless and agitated, symptoms which were also included in Engelskjön's "electrical neurosis." To modify these reactions Berkwitz used barbiturates in conjunction with the faradic stimulation.

Engelskjön was thus aware that the electrical treatment produced a psychopathology of its own, a consideration which is lacking frequently in some contemporary evaluations of the effects of electroshock therapy in which "cures" are reported entirely in terms of the remitting psychopathology of the patient's original disorder. The changing psychopathologic picture in which the psychopathology induced by the treatment process subtly overlies and alters the reactions of the presenting illness is not always critically scrutinized and described.

The contrast between the stimulating effect of faradic current and the

calming effect of galvanic electricity which Arndt and some of his contemporaries accepted as a clinically valid observation was based, to a considerable extent, upon the theory of the "electrolytic" effect of galvanism, of which Remak (47) wrote in 1858. Remak concluded from his observations on the therapeutic effects of electricity, particularly on the neuralgias, that inflammatory products were the cause of neuralgia and that the pathogenic factor was "electrolized" by the galvanic current and so therapeutically altered. That this theory of Remak had a considerable duration of significance is evidenced by the fact that Heyden (35) in 1886 quoted with approbation that Arndt used faradic current in simple depressive conditions for its stimulating effect only and that the galvanic current was employed for other psychoses because of its calming, "catalytic" effect.

The use in psychiatry of electricity from the Leyden jar and from the influence machines which superseded the Leyden jar as sources of electrostatic current was much more limited than was the employment of galvanic and faradic current. The history of the electrostatic, or influence, machine has been mentioned earlier as beginning with von Guericke's invention of a simple frictional device. Von Guericke's ideas on electrostatics were published in 1672 in his *De Vacuo Spatio*. However, Hauksbee, in 1709, made the first friction machine with which sparks could be obtained. In the nineteenth century the most popular machine of the period was constructed in Germany by W. T. B. Holtz. This was usually equipped with a charger devised by the Englishman, James Wimshurst (54). A source of electrostatic electricity, that is, of an unidirectional current of extremely high voltage (about 100,000 volts) but of very low amperage (1 milliampere or less), was thus available to medical electrotherapy of the last half of the nineteenth century.

The electrostatic "douche" and other methods of the application of static electricity, however, found only sporadic use in the psychiatry of the time. The electrostatic current required rather elaborate equipment, and it was ill-adapted for use in neuromuscular diagnosis and therapy, although the current could be interrupted to produce muscular contractions. Frequently, indeed, the uninterrupted current caused muscular contractions and raised the hair all over the body when the patient was connected with the machine. Moreover, the neurophysiologic effect of static electricity was different from that of galvanic or faradic current. Kohlrausch (55), using a Holtz machine with a 16-inch diameter plate, had established that the current given by such a machine could in 40 hours electrolyze acidulated water sufficient only to liberate 1 cc. of mixed

gases and, hence, to produce a current of less than .001 ampere. Such a low capacity continuous current differs in stimulatory effect from the near-convulsive stimuli possible with at least the galvanic electricity used in the nineteenth century.

Reports of the use of static electricity in the psychiatric treatment of the last century are difficult to find. In 1885 Benedikt (14) insisted before the Antwerp Congress on Psychiatry and Neuropathology that " Inflammatory affections of the ear occasion cerebral disorders on which static electricity exerts its influence by combating the disorder of the intracranial circulation." Two of his cases, other than those treated for otological conditions, are interesting, one being that of a woman under treatment for " neuralgia of the legs " who lost her memory for several days in succession during treatment, and the other, that of a case of amnesia which was treated successfully by the electrostatic " douche." Quite interestingly, during the discussion of Benedikt's paper, Mierzejewski, a Russian, observed that static electricity as used in the treatment methods common at the time aggravated epilepsy.

The suggestive effect of the electrostatic machine and its great value as histrionic therapy made its use for the treatment of hysteria plausible and motivated Charcot, among others, to employ it. The general position of static electricity in the psychiatric electrotherapy of the nineteenth century was definitely, however, a relatively minor one.

Like the method of the electrostatic douche which seemed to " electrify " the whole patient, the galvanic and faradic currents were also applied as a " generalized " treatment. Galvanic electricity had very early in the century been applied to the patient by allowing one electrode, usually the cathode, to dip into a basin of acidulated water into which the subject's hands or feet were placed. The other electrode was placed on the head, on the back of the neck, or somewhere along the spine. Newth (44) in 1873 was using this method, and Engelskjön (26), among others, advocated its use.

" General faradization " was an electrotherapeutic technic first described in America in 1871 by Beard and Rockwell (12), two of the relatively few American investigators in the field of nineteenth century psychiatric electrotherapy.[2] In this method, one electrode was held in a constant position, usually being placed on the feet. The other electrode was then moved in a systematic manner over certain definite points of the back, chest, abdomen, neck, extremities, and head. Beard and Rockwell recom-

[2] John Galt, in *The Treatment of Insanity*, New York, 1846, referred to treatment by electricity.

mended the procedure for neurasthenic patients and, particularly, for the treatment of depressions and of sleep disturbances. They also suggested electrization for the treatment of alcoholism. They contended that electricity in any form " Acts as a stimulating tonic with a powerful sedative influence " and that it was an " agent for improving nutrition." Fischer (28) in Germany tried the method of " general faradization " and " general galvanization " as described by Beard and Rockwell and found that the sleep and appetite of his patients improved and that there occurred a palliation of nervousness, debility, and pain, and an increase in genital functions. He referred to the principle that constitutional illnesses like " nervous dyspepsia, neurasthenia, anemia, chlorosis, hypochondria, and hysteria " should be treated by general electrization and that local diseases were indications for localized electrical treatment.

Although Beard and Rockwell had recommended systematic changes of electrode position during the usual 10 to 20 minute period of electrical stimulation, the most common practice from the beginning of the utilization of galvanic and faradic treatment had been to maintain a constant electrode position during the period of current passage. In the early nineteenth century, when skin stimulation seemed to be the therapeutic objective, the electrodes were frequently placed in the hands. The major emphasis, however, soon came to be placed upon the stimulation of the nervous system directly, especially of the spinal cord and of the sympathetic nerves. In the last few decades of the century the electrodes were applied increasingly directly to the head. This " cephalic shift " or " telencephalization " of electrode placement paralleled, therefore, the trend of the neuroanatomic and neurophysiologic research and thought of the nineteenth century.

Arndt (5), who conveniently serves as a sort of transition point between the earlier and the later psychiatric electrotherapy of the nineteenth century, at first galvanized only the spinal cord. Later he kept one electrode at the nape of the neck and the other was placed elsewhere on the body, and occasionally on the forehead. In the last 30 years of the century the electrodes were commonly placed in various cephalic positions. Althaus (2) lists three placements for stimulating both hemispheres: a) one electrode to the forehead, the other to the occiput, b) one to the left, the other to the right temple, and c) one on the left, and the other to the right mastoid process. For stimulating one hemisphere, as in the case of hemiplegia, one electrode was placed on the supraorbital ridge and the other, on or near the mastoid process of the same side.

The sympathetic nervous system was galvanized by putting one elec-

trode on the auriculo-maxillary fossa and the other, either on the transverse process of the sixth or seventh vertebra on the opposite side of the body, on the manubrium at the inner edge of the sterno-mastoid insertion, or on the inside cavity of the mouth opposite the articulation of the lower jaw.

The electrodes were fitted with various substances, the most common being sponge material. Althaus (2) recommended sponge or charcoal fitted into hollow brass sockets and attached by insulated wires to the batteries. Frommhold (31) used sponges moistened in water. Wiglesworth (58) used as a cathode a large plate "adapted to cover accurately the whole vertex of the head."

For the source of his galvanic current Wiglesworth used a battery of 50 Leclanché cells with a dial collector for bringing the cells into action two at a time. The Leclanché cell, introduced in 1868, had an electromotive force of 1.5 volts, and hence Wiglesworth had available well over 50 volts of electrical tension, an interesting consideration in view of the fact that the human threshold for electrically induced convulsions requires only 30 to 50 volts of direct current. Arndt (7) used faradic current from the secondary spiral of a large Stohrer induction apparatus and applied it in 10-minute sittings. His galvanic electricity was applied in 20-minute sittings from a battery of 30 to 40 elements. The early nineteenth century users of galvanism did not have available batteries of such large electromotive power, and they usually confined themselves to the use of 3 to 8 cells. Although Althaus suggested that the number of cells in batteries should range from 60 to 100, the highest number of cells reported used at one time even in the late nineteenth century literature was 32 (44). Actually, the ordinary current strength used in the last half of the century varied between 10 and 20 cells.

As a matter of history, the feeling was dominant in the last half of the century that for psychiatric treatment purposes more good results were obtained from a gentler application of electricity than from a powerful one (44). In fact, Althaus (2) enunciated a general principle that "A feeble current applied for a short time produces the greatest therapeutic effect."

Throughout the century the time during which electricity was applied, usually in daily or in alternate daily sessions, remained remarkably constant at from 10 to 20 minutes. The length of the total treatment course varied considerably, but it frequently endured for a month or longer.

From the standpoint of the relation to modern electroconvulsive therapy, the relatively long duration of the electrical stimuli in the electrotherapy

of the past century is interesting. As a convulsive stimulus, only the "make" and "break" of the galvanic current and its repetitive summation are neurophysiologically significant. Since the galvanic electricity used in nineteenth century psychiatry was not delivered in repetitive doses, only very rarely occurring convulsive or subconvulsive reactions were ever seen. The faradic stimulation, although interrupted, was not of sufficient strength to be convulsion-evoking. However, Althaus (2) wrote that "Sensations are caused by an application of the (galvanic) current to the head which can be only owing to a direct action of it on the cerebral matter, viz., dizziness, giddiness, sleepiness, faintness, vomiting, and even convulsions." He goes on to report that "The latter phenomena are only noticed if the current be of considerable power." Wiglesworth (58) also reported that "I have seen faintness, retching, actual vomiting, and a peculiar form of hysteroid convulsions result from too strong or too prolonged (galvanic) current." Emminghaus (24) observed "starke Hirnsymptomen" of vertigo and staggering after galvanic treatment. The unanimous opinion of nineteenth century psychiatrists was that such reactions were deplorable and strictly to be avoided.

The sub-coma insulin therapy of the present time directed towards autonomic reactions of mental disease was preceded in the nineteenth century by the electrical stimulation of the autonomic nervous system, notably of the sympathetic integration. The immediate effects of such stimulation were described by Althaus as sleepiness, dilatation or contraction of pupils, slowing or acceleration of cardiac action, and perspiration.

Modern electroshock therapy utilizes the procedure of passing an electric current between electrodes in external contact usually with the frontotemporal areas of the head in order to produce a generalized cerebral neurophysiologic stimulation which finds a motor expression as a convulsive reaction. In the last three decades of the nineteenth century, the psychiatry of the period was using the method of sending an electric current through the head between externally applied electrodes without any intention of producing convulsive reactions, while the neurophysiologists of the time were beginning to stimulate electrically cerebral tissue directly and were obtaining convulsive reactions without, of course, any thought of applying the occurrence of electrically induced convulsions as a psychiatric treatment.

Ferrier (32) is usually credited as being the first to demonstrate convulsive reactions in animals as a consequence of the electrical stimulation of the brain. However, Fritsch and Hitzig (30) in 1870 observed local contractions in muscles of the dog following faradic stimulation of the

cerebrum. In two of their animals these localized contractions generalized into reactions of an epileptic character. Bartholow (10) was apparently first to excite electrically the human cerebral cortex. Through a wound in the skull he applied an electrical stimulus to the exposed post-central convolution and evoked " odd sensations " in the patient's legs. Interestingly, Matteucci (42) in 1843 observed violent and prolonged muscular contractions in all parts of the body after the application of a current from 3 Volta cells to a patient whose post-febrile paralysis had been ameliorated by strychnine.

In 1874 Althaus (2) felt that the experiments of Erb and Burckhardt had clearly proved that the brain is really affected by a current applied outside the cranium. Ranke had stated that when current has once overcome the resistance of skin and bone it will spread almost equally through all organs interposed between the electrodes, with the greatest effect being produced near the electrodes, and Hitzig (36) regarded it as settled that continuous current can be sent through the brain in the direction indicated by the placement of the electrodes. By 1875 there was thus considerable information about electroneurophysiology available to nineteenth century medical science.

Interestingly enough, curare had been in use as a counter-convulsive agent as early in the century as 1860, when Thiercelin (53) administered the drug in the treatment of long-standing cases of epilepsy. He applied daily doses of from one-half to one grain of " woorara " to the suppurating surface of a blister and reduced the monthly seizure incidence from 20 convulsions to 5 in one case and in another, from 30 attacks to 8. Tetany, also, was shortly afterwards being treated by curare.

Pathological reports on deaths due to electricity began to appear in the medical literature of the last decade of the century. Querton (45), for example, studied the histopathology of the brain by the methods of Golgi and Nissl and reported that he found characteristic histopathologic changes as described earlier by Corrado, Marinesco, and others.

Several modifications of the electrical current were introduced in the closing years of the nineteenth century. Lapicque devised a parallel of condensers with capacities varying from 2 to 30 microfarads and obtained an interrupted current of progressive onset and decline. Because contractions in paretic muscles are less dependent than are contractions in healthy muscles on a sharp " make " and " break," Lapicque current was employed to excite contractions in paralyzed muscles without also eliciting overvigorous contractions in neighboring healthy muscle-tissues.

In 1888 D'Arsonval, while experimenting with alternating currents,

noticed that, if the electrical strength was kept constant, the more rapidly the current was interrupted the more vigorous were the resulting muscular contractions. At very high frequencies, however, no muscular contractions could be observed. D'Arsonval was thus the first one to obtain clinical high frequency current, but Tesla, in 1891, is said to have first suggested the therapeutic use of such current, an event which is the historical beginning of modern diathermy and electrosurgery.

There was some use in very late nineteenth century psychiatry of the high frequency current, particularly in France. Boinet and de Poncy (19) applied 8 milliamperes of current, oscillating at a frequency of about 1800 per minute, locally to the hands and legs for a daily duration of 40 minutes. They observed good results in the treatment of neurasthenia. Other observers reported good effects in hysteria. Apostoli and Berlioz (4), however, stressed nervous and hysterical conditions as contraindications to the use of high frequency treatment.

In 1898 Leduc (39) was experimenting with galvanic current of a capacity of 2 to 4 milliamperes which he interrupted at a frequency of about 100 times per second. By applying this current through the brain ne was able to produce in animals anesthesia, sleep, coma, and even death. Like Fritsch and Hitzig in 1870, some of Leduc's collaborators, Robinovitch and others, produced convulsions as a result of the electrical stimulation of the experimental animal's brain.

In 1944 Gruenberg (33) described the treatment of alcoholic auditory hallucinosis by electric current. The electric treatment of auditory hallucinations has, of course, a considerable history. The French psychiatrist, Baillarger, had recommended electricity as a method of treating hallucinations, and Rorie (48) in 1862 applied galvanic current to electrodes placed in the ears of a 50 year old melancholic who complained of hearing voices and noises. The current was applied for 5 to 10 minutes daily for two weeks, at the end of which time the " auditory hallucinations and noises gradually ceased, and general convalescence was instituted." Brenner (20), already mentioned, stimulated the ears with galvanic current and elicited primitive sound sensations. Jolly (37) found that psychotic subjects frequently had an " electrical hyperesthesia " and that in such subjects electrical stimulation evoked not simple noises, as in normal people, but complicated auditory hallucinations. He also described a " paradoxical reaction " which consisted of sounds being heard in the opposite unstimulated ear when the current was applied. Like Brenner, Jolly postulated that the source of hallucinations was in the acoustic nerve itself and that hallucinations were due to the hyperexcitability of the

" auditory nucleus." Fischer (29) also produced auditory hallucinations by galvanic stimulation. From the standpoint of therapeutic interest, Fischer quoted Erlenmeyer as having observed that placing the galvanic cathode in the ear suppressed hallucinations. Engelskjön (25) also had described sounds in the ear as disappearing after electrical treatment. There was, therefore, considerable nineteenth century concern with the electrical treatment of auditory hallucinosis and with the experimental production of auditory hallucinations.

The psychopathologic reaction-types which were treated by electricity during the nineteenth century included almost all disorders of behavior. Beginning with the work of Bischoff and Augustin in 1801, many of the specific behavior disorders which were subjected to electrical stimulation by one method or another have already been mentioned. One of Augustin's (8) cases, for example, is described as developing a " cataleptic fit " and then paralysis of an arm and leg following an intermittent fever. He was treated by daily galvanic applications for three weeks, which, it is said, remedied the paralysis and made the patient more alert and cheerful.

Chorea and epilepsy were diseases which were frequently subjected to electrotherapy even as late as 1868, when Rodolphi, in the *Gazetta Medica Lombarda*, reported that by the use of 10-minute daily sessions of induced current he had lengthened the interval between epileptic convulsions. He observed, however, that attacks occurring after a long interval consequent to the electrical treatment were more violent and endured for a longer time than usual. In the same issue of this Italian journal Ciano described the successful electrotherapeutic management of a case of chorea.

Hysterical reactions, of course, were the objects of electrical treatment throughout the century. Most observers saw beneficial results in hysteria following electrotherapy of any kind. Like Bischoff in 1801, Emminghaus (24) successfully treated hysterical symptoms. He reported in 1874 the cure of two cases of hysterical aphonia. Neftel (43) satisfactorily treated writer's cramp and pianist's cramp with galvanic current, and Bryce (11), the American, found electricity to be " indispensable " in certain forms of " hysterical insanity."

Sufferers from general paralysis were also subjected to electrical stimulation. Heyden (35) treated several paralytics with electricity with the result only of improving the sleep of two of the patients.

Headaches and neuralgia, too, were frequently given electrical treatment. Brunelli, in the 1867 *Gazetta Medica Italiana*, reported a cure of spasmodic facial neuralgia with electricity after 18 sittings. Eulenberg (27), however, more carefully appraised the whole subject of the electrical

treatment of the neuralgias and concluded that in cases of centrally produced neuralgia, a true cure by galvanism was doubtful and rare but that palliation of the pain was equally striking and frequent.

Bedwetting and " sexual neurasthenia " also came within the province of nineteenth century electrotherapy. Dommer (22) treated these conditions with reported partial success by passing faradic current between one electrode placed in the urethra and the other, in the rectum.

Although schizophrenic catatonia as a definite symptom-complex was not usually specifically described until after Kahlbaum's publication on the subject in 1874, cases of what must have been indisputable catatonia were subjected to electrotherapy during the past century. Arndt (6), as an instance, in a paper read in Berlin in 1872 described a case of undoubted catatonia and catalepsy interspersed with periods of excitement. Faradization had no effect except to cause respiratory slowing and increased salivation. The fact that Teilleux, Schivardi, and others referred to the successful treatment of stupor, torpor, or " melancholic immobility " indicates that at least some of their cases may have been catatonic. Certainly, the diagnosis, " melancholia attonita," which some of the nineteenth century psychiatrists, notably Wiglesworth (58), reported as favorably influenced by electrical stimulation, must have included an occasional catatonic reaction.[8] Aside from the consideration of the catatonic reactions, it is even more difficult to assess the effects of nineteenth century electrotherapy upon the other schizophrenic diagnostic categories. Bryce (11) is one of the few who mentioned electricity as being of value in the treatment of primary dementia. As a diagnostic name, " primary dementia " most closely approximates the modern meaning of schizophrenic thinking disorders.

Manic and other excitements were treated electrically by Arndt (5) as well as by Beard (11) and by others, but the neurasthenic and depressive psychopathologic symptoms were the reactions most consistently benefited by the electrotherapeutic methods of the nineteenth century. In these reactions, the results, as today, were sometimes dramatic. Engelskjön (25), for example, reported the case of a 50 year old man who had suffered for 3 months from deep melancholia. After a single treatment of faradic electricity applied through electrodes attached to the head, he is described as having arisen with a " pleasant smile " and as having said

[8] Dr. Oskar Diethelm, to whom the author is greatly indebted for critical suggestions about many psychiatric historical facts, studied many of the cases reported in the nineteenth century literature as " melancholia attonita." He found that, in most instances, such cases were schizophrenic catatonic reaction-types.

" Now it is gone." The patient was depressed again the next morning, but a repetition of the treatment again dissipated the depression. After additional treatment he returned to work but was still " a little nervous." Heyden (35) saw a disappearance of painful sensations and an improvement in the mental condition of 3 cases of electrically treated melancholia of less than 3 months' duration. In two of the cases a secondary amenorrhea was restored. Wiglesworth (58), after treating 11 assorted psychopathologic cases, observed that " simple melancholia without delusions " had the best electrotherapeutic prognosis. Wiglesworth voiced a conclusion with which most nineteenth century psychiatrists would have concurred. It was his opinion (58) that " The more the cases departed from simple depression in the direction of stupor and torpor, the more good the treatment seemed to do." Beard (11), an American contemporary of Wiglesworth, felt that the " melancholia dependent on the change of life " was particularly manageable by electric treatment. Newth (44), too, wrote that " In those cases where there seems to be a want of tone in the nervous system (depression) the continuous current has in the majority of cases a most marked beneficial effect."

At the end of the century, the psychiatrists of the time had not been able to arrive at a satisfactory explanation of the empirically observed effects of psychiatric electrotherapy. In 1884 Engelskjön (26) had confessed that " The effect of electricity is still wholly unclear." A few years earlier Althaus (2) had expressed not only the inability to rationalize the therapy but also gave evidence of the suspicion with which electrotherapy was regarded in his observation that " There are few remedies employed in the treatment of disease on the value of which the professional mind is less settled than on that of galvanism." The distrust of electrotherapy continued through the turn of the century, as substantiated by Swolfs' (51) insistence in 1897 that electrotherapy was scientifically grounded and by his criticism of the existing wide scepticism and insufficient instruction in this subject. That the scepticism existed there can be no doubt, as demonstrated by an abstract of Mann's (41) analysis in 1898 of contemporary work on the electrotherapy of the " functional neuroses," which, incidentally, contained a preponderance of French contributions. The reviewer sums up his abstract with " Wenn doch die Elektrotherapeuten etwas Skepsis lernten! "

The electrotherapeutic conference held in Frankfurt in 1891 (56) was of the opinion that electrical treatment was of value in peripheral nerve paralysis, in hysteria, and perhaps indicated also in neurasthenia to stimulate the skin and circulation. The sleep-producing effect of the galvanic

current was recognized. However, motivated, partly at least, by the fact that suggestion and hypnotism were being popularized at the time by the Nancy School, the question was frequently asked "Can electrotherapy produce any effect not produced by suggestion?" There was also considerable insistence by the conferees that experimental studies on the effects of electricity should be initiated.

The attitude towards electrotherapy in psychiatry at the end of the nineteenth century was, therefore, one of increasing doubt as to the value of electrical treatment in any other application except a frankly suggestive one for the treatment of hysteria. Because of prejudice, lack of consistent success in the use of electrical procedures, and the increasing interest in other methods of therapy, psychiatric electrotherapy was definitely on the wane at the beginning of the twentieth century.

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THE KYESTEINE* PELLICLE

An Early Biological Test for Pregnancy

MARK MARSHALL

When the writer began the practice of medicine in 1912, one of the first patients to appear was a woman bringing a sample of her urine asking that it be "tested" to determine whether or not she was pregnant, thus anticipating the Aschheim-Zondek discovery by many years. This experience repeated itself occasionally during the first few years of practice, but later it was no longer encountered. I always attributed this request to ignorance on the part of the patient, fostered by the hope that she might escape the embarrassment of being examined. It certainly never occurred to me that there had been, or ever would be, any scientific grounds for such a request. A very discerning colleague of mine, however, whose practice included a great many obstetrical cases, arrived at the conclusion that there must have been in common use, in the years gone by, some sort of urological test for pregnancy, which had long since been discarded by an enlightened medical profession, but the knowledge of which had been handed down from one generation of women to another and still persisted in the minds of a few of the less intelligent ones.

I was, therefore, especially interested a few years ago to find, while perusing some old medical literature, that there had been just such a test, the discovery of which was first announced more than a hundred years ago. It occupied an important place in medical literature for many years, but was finally discredited and later completely forgotten. I have talked with many physicians, including gynecologists and obstetricians, concerning this old test and none of them had ever heard of it, with the exception of an elderly colleague, who recalled, after the matter was brought to his attention, that his professor of Obstetrics, in 1882, had lectured to the class concerning it. My colleague stated, however, that he had never made use of the test himself, as he did not feel competent to interpret it, but that he knew of certain older practitioners who had used it to some extent.

Many years later, and quite independent of any previous urological test for pregnancy, the Aschheim-Zondek procedure was developed, based

* Pronounced Kē-ēs-tē-in. Various spellings were used. The French and English writers spelled it Kyéstein or Kiéstein, frequently omitting the final e in either case. Many of the German writers, on the other hand, spelled it Kystein, dropping one syllable entirely, thus ignoring its Greek origin.

upon the presence of *a newly discovered constituent* of the urine of pregnancy; a so-called hormone. It is not unusual for a scientific truth thus to reappear in a new guise after it has been buried and forgotten, rediscovered, as it were, by a new explorer, who, in his zeal, fails to see the footprints of his predecessors.

With your indulgence, I will review briefly the literature concerning this old test for pregnancy, in order that you may follow its development to a point of wide acceptance and that you may realize its remarkable accuracy in the hands of experienced workers. It is also especially interesting to see how an inherent weakness in its basic hypothesis rendered it so vulnerable that it could not withstand the criticism of its opponents, who finally caused it to be unjustly repudiated.

In 1831, Jacques Louis Nauche presented to the Société de Méd. Pratique of Paris his observations on the occurrence of a substance in the urine of pregnant women, which, if the urine were allowed to stand, would collect on the surface as a film or pellicle, of a pearly white color, having very much the appearance of a pellicle of fat on the surface of cold broth. To this substance, he gave the name Kyesteine, the word being rather loosely derived from a Greek word meaning conception. I have been unable as yet to obtain a copy of the Transactions of the Société de Méd. Pratique for 1831, containing Nauche's article, but I have read a number of reviews of it and will quote from one by Elisha Kane.

> If the urine be exposed for a few days in a glass, the Kyesteine shows itself at the surface in the form of specks and oblong filaments, which unite to form a pellicle or scum of a line in thickness. The pellicle thus formed, he regards as furnishing a certain test for pregnancy, almost from its commencement, if the woman be in health, and he asserts that he has frequently determined by reference to it the existence of pregnancy, where it would not otherwise have been suspected. He then tells of certain other conditions which may produce a surface film resembling somewhat that observed during pregnancy, but he affirms that after a little practice, these are distinguishable at a glance.

Both Avicenna and Hippocrates claimed to have recognized certain peculiarities of the urine of pregnancy, and it is quite probable that they did observe certain of the changes occurring in the resting specimen. Savonarola, undoubtedly, observed the cloud which forms in the urine of pregnancy before the surface pellicle develops. He recorded this observation in 1486. But it remained for M. Nauche to describe much more fully and completely the distinguishing features of the urine of pregnancy and to utilize his observations in practical diagnosis.

This most interesting observation of M. Nauche was reviewed by the

various medical journals in England, France and Germany, but no serious attempt was made to verify the work until years later (1839), when M. Tanchon, of the St. Genevieve Dispensary in Paris, reviewed the work of M. Nauche and published his own researches on the subject in the *Lancette Français*. I will quote from a review of Tanchon's article, which appeared in the *Medico-Chirurgical Review* of the same year.

> He examined the urine of twenty-five pregnant women, and in every case he detected the presence of Kyesteine. He states that the urine of a pregnant woman collected in the morning is usually of a pale yellow color and slightly milky in appearance. It is not coagulated by heat, or does it respond to any of the tests which indicate the presence of albumin. Left to itself and exposed to the air, from the second to the sixth day, we perceive small opaque bodies rise from the bottom to the top of the fluid. These gradually collect together to form a layer which covers the surface. This is the Kyesteine. It is of a whitish or opaline color and may be aptly compared to the layer of greasy matter which covers the surface of fat broth when it has been allowed to cool. Examined by the microscope, it exhibits the appearance of a gelatinous mass, which has no determinate form. Sometimes small cubical crystals can be perceived in it when it becomes stale.
>
> The Kyesteine continues in the state we have now described for three or four days. The urine then becomes muddy and minute opaque bodies detach themselves from the surface and settle at the bottom of the vessel. The pellicle thus becomes soon destroyed.

In four of the twenty-five cases, pregnancy had not been suspected until the Kyesteine was found in the urine.

This article of Tanchon's at once attracted attention and was reviewed in the journals throughout Europe and America and furnished the inspiration for further investigation of the subject in various medical centers.

The next article to appear on the subject of Kyesteine was in 1840 by Dr. Bird, of Guy's Hospital, London. Dr. Bird's researches were published in the Reports from that institution for 1840 and bore the following interesting title, " Observations on the Existence of Certain Elements of the Milk in the Urine during Utero-gestation and on the Application of this Fact to the Diagnosis of Pregnancy." He described the phenomenon of the Kyesteine pellicle very much as had his predecessors, but he did not believe that the substance should be dignified by a new name. He concluded from his researches that the pellicle was a form of casein mixed with the crystals of ammonium phosphate, that this casein-like substance was probably the material from which the milk is produced; that as soon as pregnancy occurs it is elaborated in the blood and is further changed by the breast into milk and that this substance in certain quantities finds

its way through the kidneys into the urine during pregnancy, but that after nursing begins, its level in the blood is lowered to the point where none escapes into the urine. Professor Burdach, of Königsberg, in his *Die Physiologie als Erfahrungswissenschaft*, had previously mentioned the possibility of milk or certain elements of the milk appearing in the urine and Bird quoted him in support of his theory. A short time following delivery, the Kyesteine pellicle is no longer found. As further evidence of his hypothesis, he presented a case in which, in a nursing mother, the Kyesteine reappeared in the urine when the nursing was interrupted and disappeared again when nursing was resumed. Bird reported thirty cases that came under his observation in his obstetrical and gynecological service at the Guy's Hospital. Two of them were unmarried girls, who steadfastly denied the possibility of pregnancy, but the Kyesteine was present in the urine and subsequent observation verified the diagnosis of pregnancy. He reported three false negatives in his series which later became positive, however. This occurrence was explained by Bird in the following language. "The three women whose cases seemed to be exceptions to the general rule were all affected with inflammatory fever accompanying severe catarrh. The urine was turbid with urates. On the disappearance of the latter by the convalescence of the patients, the phenomena characteristic of pregnancy appeared." Thus in his series of thirty cases, the new diagnostic procedure might be said to be 100% correct. Bird objected strenuously, however, to the term Kyesteine, since "we are not justified in considering it as constituting a new organic principle." Bird's article was very convincing, widely quoted and his conception as to the true nature of Kyesteine was accepted by many. He made extensive chemical and microscopic examinations of the pellicle. He found that it was not dissolved by acetic acid, nor by heat, and that under the microscope it appeared to be amorphous. He emphasized a cheese-like odor that emanated from the pellicle and he regarded this as an essential characteristic. He concluded his article by saying, "Taken in connection with other findings, the formation of a caseous pellicle in the urine affords very valuable corroborative indication of the existence of pregnancy." In the third edition of Bird's classic treatise on *Urinary Deposits*, as well as in the subsequent editions, he includes in the chapter on the urine of pregnancy a most interesting letter from William W. Gull, of the Guy's Hospital Staff, reporting a case of hydatid mole, which came under his observation, in which the Kyesteine test was strongly positive.

The patient had not menstruated for four months and for the first three months she regarded herself as pregnant, but during the fourth month the breasts had become flaccid and the abdomen did not enlarge and she developed a reddish brown discharge from the vagina. The urine showed a Kyesteine pellicle and Dr. Gull regarded the case as one of pregnancy with threatened abortion. For three successive weeks, the urine contained Kyesteine, but after this no traces of it could be found. After several months, Ergot was administered and a large mole was expelled. No trace of a foetus could be found.

In 1841, Becquerel, a recognized authority on the urine and author of a book, *Séméiotique des Urines*, took exception to the claims of Nauche and Bird. He examined the urine of three pregnant women, but found no traces of Kyesteine. Obviously, this was hardly a fair test and was evidently so considered by his contemporaries, for, in spite of Becquerel's wide reputation, his comments did not lessen the interest in Kyesteine.

The next work to appear upon the subject was an article by Elisha Kane in the *American Journal of the Medical Sciences*, in 1842. Kane was a medical student at the University of Pennsylvania. He carried out an extensive investigation of the subject and presented his findings as an inaugural dissertation for the degree of Doctor of Medicine. Kane was quite open-minded in his approach to the subject. He felt that conclusions had been drawn from too small a group of cases, the total being up to that time less than sixty. After stating the general plan, which he had pursued in his work, he made the following significant statement. "And I may be excused for adding that a candid spirit; not too much biased in favor of theory to admit the existence of observed exceptions, that looks to each clearly ascertained result as an independent element and rejects nothing that appears true because irreconcilable with what was known before; is not less important to the formation of correct opinions than the most careful and varied scrutiny of facts." Such idealism in approaching a scientific question gives one ample assurance as to the integrity of the investigator, while if further proof is needed, it may be found in the later accomplishments of Elisha Kent Kane, the world renowned Arctic explorer and author of two well known books dealing with his expeditions into the then unexplored Arctic regions. Kane was only 22 years old when he carried out his experiments with the urine of pregnancy. His mental equipment, however, was most unusual. His education had been interrupted and at all times seriously handicapped by rheumatic heart disease; however, he was well grounded in chemistry, mathematics, and the natural sciences. As he had never been a candidate for a degree before beginning the study of medicine, he had always been able to pursue his

studies in a manner conducive to the development of a philosophic viewpoint, a habit of mind which makes a good explorer in any field.

His Kyesteine studies were carried out at the Blockley Hospital in Philadelphia under the critical eye of the great Dunglison. After the presentation of Kane's thesis, the University faculty passed the following resolution under date of March 18, 1842: "That the dean be desired to communicate to Mr. E. K. Kane the approbation of the faculty for his able and instructive thesis, and that he be requested to have it published."

Kane reported a larger series of cases by far than anyone who preceded him. He examined the urines of eighty-five pregnant women; of these, sixty-eight gave a well marked pellicle of Kyesteine. Eleven gave a modified pellicle, but one which was clearly recognized, however, as Kyesteine, and six gave no pellicle at all. He repeatedly found the Kyesteine before the second month of suspended menstruation. He examined the urines of twenty-eight non-pregnant cases. Some had pellicles, but none were characteristic of Kyesteine. Kane emphasized as important not only the appearance of the pellicle, but the time required for its formation, and the manner of its disappearance. His protocols were well kept and since he accepted Bird's view that the Kyesteine was a form of casein, each tabulated case was accompanied by notes on the condition of the breasts. On the whole, I regard Kane's article as superior to any that I have read on the subject. He showed a much greater familiarity with the detailed appearance of the various surface films and manner of their formation. His large experience and his great skill showed in his diagnostic results, his percentage of error being remarkably low. He reported in detail a very interesting series of sixteen unknowns, nine from his own series and seven submitted by a colleague at the Philadelphia Hospital who had worked under Kane's direction. All of these were correctly diagnosed. In some of them, the urinary finding was contrary to the presumptive evidence afforded by the history and physical examination.

In this report, he makes mention of the very many times the Kyesteine test enabled him to detect deception on the part of patients. There were those who, though pregnant, denied the possibility of it, and others who feigned pregnancy.

The following is a verbatim report of Kane's series of unknowns:

EXAMPLES OF CASES TESTED BY THE KIESTEINIC INDICATION.

1. Helen Anderson, aetat. 18, Woman's venereal ward, was under treatment for commencing secondary symptoms, attended with a recent gonorrhea. Her habits

were extremely irregular, and her intercourse had been for the last eighteen months promiscuous. The menses had during this period been much interrupted, and for the last twelve months were entirely suspended.

Her abdomen attracting attention from its increased size, the urine was submitted to examination, and presented a well-marked pellicle; a second trial gave the same result: some time after, she was removed to the obstetrical ward, and here delivered of a premature infant.

2. Mrs. Mary Welsh, aetat. 37, May 25th, 1841, white obstetrical wards, had been for two years an inmate of the women's out-wards. On the 23rd of July she married for the second time, having had by her former husband five healthy children. Some months after her marriage, her menstrual function was somewhat deranged; but for two months immediately preceding, and for three after, its regularity was uninterrupted. Since the 27th of October her catamenia have entirely ceased, the cessation being unaccompanied by the ordinary indications of a "change of life." Her sensations resembled those of previous pregnancies; and on the following March, five months after, she distinctly felt the motion of the child.

Wishing in the course of my observations, to procure some urine from pregnant females well advanced, I sent for ten specimens of which there could be no doubt, and included this woman on my list. I was surprised to find that her urine presented no kiesteine, and submitted it in consequence to another trial; and this giving the same result, I noted the case as an exception, and so mentioned it to Dr. Dunglison and to others.

While in her eighth month, however, I made a third examination, which presenting also no pellicle, led to a close investigation of her case, and finally to her dismissal from the ward on my own responsibility.

That there were many evidences of pregnancy, and that the absence of the peculiar pellicle had much influence on her discharge, will be seen from the subjoined examination made in the eighth month.

Mammae.—Large and protruding; much developed; nipple prominent; the disc somewhat tumefied, and the general condition rather firm than flaccid. By pressure, a yellowish, milky fluid exuded from the breast, and the papillae were quite mammelated from the enlargement of the follicles. Abdomen.—Tumid, and much protruding, the rugae of previous pregnancies having disappeared by the tension; the naval, although not prominent, was not depressed. On percussion, generally flat, but tympanitic around the umbilical region. Uterus examined per vaginam, rigid, rather patulous about the mouth; vagina very rugose and contracted, dry and badly lubricated. By auscultation and the stethoscope, I made out no foetal pulsation, although opinions were divided as to its existence; a souffle was distinctly heard; but I did not feel myself competent to decide as to its character. By ballottement, no result.

After carefully considering the above case, I discharged her, much against her own wishes and those of her fellow patients, to the female working wards, where she remains at the date of this paper without a change of symptoms.

3. Isabella Smith, aetat. 25, entered the white obstetrical wards on the 20th of April, 1841, professing to be in the eighth month, and presenting so many indications of well advanced pregnancy that no deception was suspected. A series of epileptic paroxysms, which prevented the usual more rigid examination, caused her

temporary removal to the woman's lunatic asylum, where, on the morning after her admission, I procured a specimen of her urine. The absence of a pellicle on two trials, made at the instance of Dr. Dunglison, satisfied me that she was an impostor; and on the 28th, during a well simulated paroxysm of epilepsy, her dress gave way, and disclosed an abundant mass of hair padding ingeniously arranged over the abdomen.

4. ——— ———. Black obstetrical wards. This woman came into the ward in the sixth month, as she supposed, with arrestation of the menses, tumid abdomen, enlarged mammae, etc.

At the time of procuring the first specimen of her urine, I was assured by the nurse and herself that they felt the motion of the child. No indications of the kiesteine were present, however, and a second trial giving the same result, she was dismissed from the ward.

5. Mary Patterson, aetat. 30, in the women's venereal ward, supposed herself pregnant, and had so many of the signs as to render her case an undecided one. Her urine gave no pellicle, and in the result this test was found correct.

6. I have at this moment before me a letter from Dr. T. Lindsey Walker, of Va., one of my colleagues at the Philadelphia Hospital, to whose intelligent interest I am much indebted, in which he states, that for seven specimens of urine presented under fictitious names, and at a distance of two miles from the place where they were voided, I successfully indicated the only four, which were those of pregnant females.

7. S. C. ———, aetat. 22. Her urine was presented to me by a medical friend, requesting an opinion. The evidences of pregnancy were well marked, and to many conclusive. Repeated trials of her urine in no instance gave the kiesteine, and subsequent examination confirmed the accuracy of its evidence: she was not pregnant.

8. Maria Hero, aetat. 15. This young woman, at the very commencement of my experiments, refused to give me her urine, and when at last I succeeded in procuring a specimen, it yielded no pellicle. I made a second trial, and this gave the same result. Embarrassed by this apparent contradiction of the other indications in her case, I determined to make a third trial, and obtained a perfectly marked kiesteinic pellicle. I learned on subsequent inquiry, that she had, on the two first occasions, borrowed urine from her neighbor.

This was only one of very many cases of attempted imposture detected in the course of my examinations.

9. Miss ——— ———, aetat. 23. Applied to Dr. N. Benedict, of this city, for a course of treatment for suppressed menstruation. Her previous character had been undoubted. He had felt an interest in the inquiries which I was conducting, and sent me a specimen of her urine for examination.

It presented on the third day the kiesteinic pellicle so well marked as to leave no doubt in my mind as to the proper diagnosis of her case. Having reported to him accordingly, he declined administering emmenagogues, and in the result she reluctantly confessed herself in the second month of pregnancy. She is now awaiting delivery.

With another case, of the many which I have had the pleasure of determining for the same gentleman, I will now conclude.

10. Mrs. M——— M———, aetat. 32. Since her marriage, which occurred five years ago, has been the mother of three children, the interval between them being of nearly uniform duration. At the expected period, experiencing well understood symptoms, she supposed herself again pregnant. Her urine, tested in the third, fifth and seventh weeks, presented no pellicle. Her symptoms were now augmented by a host of sensible signs; and finally a fourth trial, made after averred quickening gave no kiesteine, led me to consider her case as an exception, and to note it as such in my tables.

Since that date, however, I am enabled to add her name to my confirmatory list; a subsequent examination making it perfectly evident that her condition is owing to other causes.

Kane showed that a moderate temperature was required for the best development of the pellicle; that in very hot or very cold weather, the Kyesteine formed very reluctantly, or not at all, also a very damp room might produce a fungoid modification of the pellicle, and he insisted that the specimen be kept at absolute rest. Kane made a special study of ninety-four nursing mothers. He found that, in most cases, the Kyesteine disappeared as soon as nursing was established, but that it reappeared if for any reason the nursing was interrupted. He caused it to appear and disappear at will by repeated interruptions in the nursing. Kane's observations with nursing mothers convinced him of the accuracy of Bird's hypothesis concerning the nature of Kyesteine. Kane summarizes his conclusions as follows:

1. That the kiesteine is not peculiar to pregnancy, but may occur whenever the lacteal elements are secreted without a free discharge at the mammae.

2. That though sometimes obscurely developed and occasionally simulated by other pellicles, it is generally distinguishable from all others.

3. That where pregnancy is possible, the exhibition of a clearly defined kiesteinic pellicle, is one of the least equivocal proofs of that condition; and

4. That when this pellicle is not found in the more advanced stages of supposed pregnancy, the probabilities, if the female be otherwise healthy, are as 20 to 1 (81 to 4) that the prognosis is incorrect.

I have dwelt thus at length upon Kane's work, for it was his skill in the application of the procedure in practice as well as the scientific character of his observations that elevated Kyesteine to such a high position in the medical world. Little wonder, therefore, that his essay should have been sent for publication to the *American Journal of the Medical Sciences*, bearing the endorsement of the faculty of the University of Pennsylvania.

At about the same time that Kane was doing his work, Letheby, in the *London Medical Gazette*, reported fifty cases of pregnancy, forty-eight

showing Kyesteine, and in the urine of seventeen non-pregnant he did not find it at all.

In 1848, Golding, another English obstetrician, wrote a very comprehensive monograph on the signs of pregnancy. He dealt particularly with the medico-legal aspect of suspected cases of pregnancy. He made the very emphatic statement that "*the kyesteine pellicle is the only certain test of pregnancy before the foetal heart can be heard.*" He concludes that Kyesteine in the urine is present throughout the whole period of utero-gestation in *every* case. He also demonstrated that it disappears if the foetus dies. He says that Kyesteine occasionally may be absent from the urine for very brief periods, or at least it may fail to appear on the surface of the urine, but further tests will invariably show it.

The whole subject of the Kyesteine pellicle had its development in the French and English literature reaching its greatest height with Golding's monograph. The German scientists were slow in considering the subject of Kyesteine, but in 1845 an article by Kleybolte appeared, in which he stated that the presence of Kyesteine was quite indicative of pregnancy and that he found it positive in one case five days after conception.

In 1846, Zimmerman, another German worker published the results of his investigation, in which he concludes that the Kyesteine results from the growth of vibriones or bacteria in the lower strata of the liquid, which rising to the top, unite with triple phosphates, amorphous phosphates of lime and urates of ammonia to form the pellicle. This finding led him to deny the existence of any ingredient peculiar to the pregnant state, and he inferred, therefore, that, such being the case, all claims concerning the test should be abandoned. His observations on the pellicle were, doubtless, correct as far as they went. The superiority of the German microscopes at that time was unquestioned and led naturally to the microscopic or morphological approach to the problem of the Kyesteine pellicle. But, how short-sighted and provincial to allow this one bit of evidence to discredit the whole case! What an opportunity he lost in not accepting the remarkable observations of such men as Nauche and Kane at their face value, regardless of their underlying hypothesis, and then, with his superior equipment, add something constructive to the problem, formulate a new hypothesis, if need be, to support the incontrovertible facts of the phenomenon, but cherish the facts. But, it would have required a Pasteur to have properly investigated this bacteriological growth on the surface of the urine of pregnancy, to have evaluated the conditions governing its appearance and disappearance and thus formulate a new hypothesis, one that would satisfy every requirement.

In 1851, Veit corroborated Zimmerman's findings and referred to the greater alkalinity of the urine of pregnancy as perhaps a factor in producing the pellicle. He said that he had frequently observed the phenomenon in the urine of men and of non-pregnant women.

In the 1851 edition of Churchill's *Science and Practice of Midwifery*, there is quite a long discussion evaluating the Kyesteine test. He mentions briefly a French worker, who placed vessels of urine in atmospheres of hydrogen and of nitrogen and showed that under such conditions the Kyesteine failed to appear and concluded, therefore, that Kyesteine resulted from the action of oxygen upon certain matter that is found in excess in the urine of pregnancy. He states, however, that this matter is found, but to a lesser extent, in all urines.

In 1856, Elliott, an American, examined a large number of specimens, but not in the approved technique of Nauche. Instead of placing the urine in glass cylinders or tubes, he used wide shallow vessels and placed only one ounce of urine in each. He quoted no authority for so performing the experiment, nor did he emphasize it as an original method of his own. Apparently he was laboring under the impression that rapid evaporation was the thing to be desired. Borrowing courage from the German writers, he treated the subject in a flippant manner and with the attitude of one saying the last word on the subject. He told with great delight of the many times he had found Kyesteine in the urine of male patients. Neither the idealism of Kane, nor the scientific integrity of the English and French workers could be found in Elliott's work. As a writer, he was superficially clever, and, with the support of Zimmerman and Veit, he was able to present his case in a manner which would be convincing to one not familiar with all the literature of the subject. His work was not worthy of serious consideration, but I have included it here for the sake of historical accuracy, and as being representative of a type of article that was sure to appear at this stage of the controversy.

In the years 1845-48 and '53 respectively, monographs appeared in Latin, devoted to the subject of Kyesteine. I have in my possession one of these, *De Kyesteinio*, by Maurers, published in 1853. The other two, I have not seen, nor can I find any reference to them in the literature, other than their listing in the catalogue of the Surgeon General's Library.

Maurers' work was little more than a brief review of the literature of the subject and a verification of the work in the application of the test to a few cases. It was presented as an inaugural thesis for a degree from the University of Berlin.

In 1861, Braxton Hicks, the famous London obstetrician, published an

article in the *Guy's Hospital Reports* under the following title, " Remarks on Kyesteine and its Existence in Virgin and Sterile States." He reported seven false positive cases. These seven cases may be briefly reported as follows:

Case 1. Single, aet. 33; hymen perfect, uterus very tender; menses fortnightly. Kiestine was found in the urine. She was under observation for a year.

Case 2. Married, aet. 22. Had never had the slightest symptoms of pregnancy. Has two fibrous tumors in uterus. There is milk in breasts, and kiestine in the urine; menstruations always regular. Has been under observation for eighteen months, without change.

Case 3. Married eight months. Suffering from congestion of uterus. Menstruation always regular. Kiestine in the urine; milk in breasts. Remained under observation for many months, without any change.

Case 4. Prostitute, who had never been pregnant, nor had had any suspension of menstrual period. Fibrous tumor in anterior wall of uterus. Kiestine existed in the urine, though not very copiously; no milk in breasts. Under observation for some months, without change.

Case 5. Healthy young woman, aet. 21; imperforate hymen, retained menses; vagina distended to the utmost and uterus about size of a large fist, as far up as umbilicus, Kiestine well marked. No milk in breasts.

Case 6. Single, aet. 40. Hymen would not allow the little finger to pass; large multilocular ovarian tumor. Kiestine in urine, well marked; no mammary secretion.

Case 7. Married, aet. 40. Has never had any symptoms leading to a suspicion of pregnancy; has a large multilocular ovarian tumor, which has been tapped twice, and injected with iodine once. Kiestine very marked; no mammary secretion.

Hicks attributed these false positive results to the fact that the pathology in each case was of a kind that induces a vicarious activity of the breasts, with the consequent appearance of a casein-like substance in the urine.

Hicks made no reference to the German literature. He did not mention the vibriones that form at the surface and which sometimes vitiate the experiment. He pointed out that time could be saved by examining directly the rising clumps in the fluid, which later combine to form the pellicle. This, he examined both chemically and microscopically and formulated rules for its identification, the latter corresponding essentially to the tests described by Bird. Hicks concluded his essay by saying, " Kiestine has been hitherto considered so decisive a test of pregnancy—at least at some time or another—that when found in the unmarried woman, has condemned her character at once. That this is correct in the majority of cases, I have no doubt, but to apply it to everyone is an instance of arguing in a circle tending to mislead the practitioner and do injustice to the innocent."

This element of doubt, introduced by the famous Braxton Hicks, had, I am sure, a profound influence upon obstetricans throughout the English-speaking world. In fact, comparatively little investigative work was done relative to the subject after this article was written.

In 1875, Poggi, an Italian worker, concluded from rather superficial research that Kyesteine formed in any urine in which uric acid was present in abundance; that it had no value as a test for pregnancy, but that it might serve as an indication of certain pathological states.

Beginning with Churchill's text (1851), but more particularly after the article by Braxton Hicks in 1861, the Kyesteine literature was more or less confined to the textbooks of Obstetrics, in which one finds pro and contra discussions of the subject; attempts to evaluate the procedure properly, showing a tendency to doubt its value, but obviously finding the subject too obtrusive to omit entirely. Usually attempts were made to explain the phenomenon on the basis of certain exaggerated physiological conditions or certain pathological conditions found in pregnancy.

Just what was this phenomenon of the Kyesteine pellicle? I have had the opportunity of repeating this test but a few times, but a sufficient number of times, however, to find it most fascinating, especially if one looks at these specimens through the eyes of M. Nauche and his followers. The Kyesteine pellicle has the identical appearance of the pearly white layer of fat on cold broth. The surface is often billowy and under a bright light glitters like fat. One's first impulse is to look at it under magnification, where it appears as a dense mass of bacteria, in which one sees crystals of various kinds and some amorphous material. For the most part, the urine from the non-pregnant individual develops a thin film with a very smooth surface with an iridescent sheen and appears to be made up principally of the salts of the urine. I examined one specimen from a woman in the eighth month of pregnancy that developed no pellicle, except the most delicate sheen. Two days later, however, a specimen from the same patient gave a very positive test.

It seems quite apparent that the urine from the pregnant woman furnishes in most instances the optimum conditions for the growth of certain universally distributed organisms, while that of the non-pregnant does not as a rule afford these conditions. Kane's observation that extremes of temperature prevent the formation of the pellicle, and also the fact that it will not form in an atmosphere of hydrogen or nitrogen, suggests at once the bacterial nature of the substance.

Such being the case, a modern article by Guiseppe Tatta, in the *Italian Review of Gynecology* for October, 1934, offers interesting food for

speculation. This article is entitled, "The Influence of the Hormones of Pregnancy on the Growth of Bacteria." This work was done with no reference whatever to the phenomenon of the Kyesteine pellicle, indeed, apparently with no knowledge of it, but I am sure you will agree with me that it bears an intimate relationship to it. Tatta conceived the idea of adding the urine of pregnancy to the culture media in order to supply the necessary hormones for his experiments, but in working with the paratyphoid A organism, he found that the salts of the urine exerted an inhibitory effect upon the growth of the cultures. However, when any of the commercial hormones of pregnancy were added to the culture media, the multiplication of the organisms was enormously enhanced. By using the plate method, he found that the cultures to which the hormones were added produced 10 to 15 times as many colonies as the controls. He also found that small amounts of the hormones produced just as great an increase in the growth as did the larger amounts, which led him to express the opinion that the hormones were comparable to enzymes.

This work of Tatta's although it was done presumably without any knowledge of the Kyesteine literature, would seem to furnish an adequate explanation of the phenomenon of the Kyesteine pellicle and serve also to place it in the category of biological procedures.

The false positive group of cases of Braxton Hicks may now be better understood. It was this type of case which Aschheim and Zondek soon found necessitated modification of their procedure designed to make it less sensitive. This, they accomplished with remarkable success, as you well know, by standardizing all of the conditioning factors of the experiment as well as by defining various degrees of the reaction, only the third degree being accepted as positive of pregnancy.

In cases of suspected hydatid mole, a condition which is characterized by enormous quantities of hormone in the urine, a special problem was presented, which was solved by using smaller amounts of the urine, amounts which in pregnancy would result in a negative test.

The false negative group is obviously not so easily disposed of, since there may be many and varied conditions in the urine to inhibit the growth of the particular saprophytes involved in the production of the pellicle. However, Golding, as well as others, pointed out the propriety of repeating the test when negative, since a single positive test may properly be regarded as conclusive, while a negative test may be due to some transient inhibitory factor. If this group of false negatives were investigated in the light of our modern knowledge of bacteriology, no doubt, they might be explained, though, of course, they might still present

an insurmountable obstacle in the matter of making the test always dependable.

The return of the Kyesteine pellicle when nursing is interrupted, as shown by both Bird and Kane, brings up a question which, so far as I know, has not been investigated by modern methods, but as one reads the painstaking work of Kane relative to this problem, one feels confident that when it is so investigated, his findings will be corroborated. However, we do find in certain recent work a possible corollary to this phenomenon, it being found that certain of the hormones of pregnancy inhibit the flow of milk, and this fact is made use of in practice in cases where it is desirable to take the baby off the breast.

I am sure we would all agree that M. Nauche and his followers held within their grasp a great scientific truth, which they recognized as such, and which they developed to the extent of their abilities, limited only by the primitive methods they had at their command. Their opponents, on the other hand, lacking in scientific vision, saw only the defects in the procedure and allowed them to overshadow the factual observations. Thus, doubts were created, which eventually ripened into convictions. Its enthusiastic supporters gradually died off and soon there was no one left to defend it, and as a result, a succeeding generation lost it entirely.

Nothing remains today of this interesting diagnostic procedure, except a meager definition in our medical dictionaries and a final repudiation of the test by Aschheim in his published work on the diagnosis of pregnancy from the urine.

Dorland defines Kyesteine as, "a film sometimes seen on the surface of stale urine, formerly believed to be a sign of pregnancy." That definition possesses the finality of an epitaph, and such it is, for, even though it may not have been specifically intended, nothing could survive its implications, reminiscent of the divinations of black-magic.

Aschheim did little better by it, as we shall see by referring to his written word. In the introduction to his monograph on *The Diagnosis of Pregnancy from the Urine,* he disposes of the whole question of the Kyesteine pellicle in a few lines. He attempts in a perfunctory manner to give his work a proper historical background by reviewing various previous attempts to diagnose pregnancy from the urine.

He begins by selecting from ancient times certain necromantic practices, pure folk-lore, which are not representative of the scientific efforts even of that dark period, ignoring entirely the significant observations of Avicenna, Hippocrates and Savonarola.

And then from the modern period, he refers to the work of M. Nauche and does so in the same perfunctory manner and with the same indifference to historical material that characterized his gleanings from the more remote period. He accomplished this not by reviewing the original sources, but by quoting the conclusions of certain of his fellow countrymen in their respective compendiums of Obstetrics.

First he quotes from Winckel's *Handbook of Obstetrics,* in which Skutsch is quoted as saying that " various attempts have been made to diagnose pregnancy from the urinary findings, but without success." Then more specifically, Skutsch says, " According to M. Nauche and others, a scum develops on the urine of pregnancy which from the early period of pregnancy is characteristic." To refute this statement, however, Aschheim quotes from Spiegelberg's *Lehrbuch* the following: " The Kyesteine pellicle is found in the urine of other women and in men, and it consists of a protein substance, triple phosphates, fungi and infusoria." With this brief and dogmatic statement, the reader is left to draw his own conclusions, namely, that since the pellicle cannot be shown to be a new organic principle, the phenomenon is not worthy of further consideration.

Then, as if the conclusions drawn by these great authorities were not sufficient, Aschheim adds his own personal condemnation of this and all previous attempts to diagnose pregnancy from the urine by contributing the following sweeping statement. " However, all these efforts in some manner to diagnose pregnancy from the urine have attained no significance for the practice of medicine; my own checkings on several of the results accomplished, have shown me the unsuitableness of the procedures for practice." And there you have it: a final, lethal blow to that most promising conception of M. Nauche. Can it be possible that he had read the work of Elisha Kane with his high percentage of correct diagnoses and his list of interesting " unknowns," all of which he diagnosed correctly, or his most intriguing observations on the urine of nursing mothers? Did he ever hear of Braxton Hicks and his highly suggestive group of false positive cases, cases of a type which he himself had already dealt with and solved with the refined methods afforded by the present generation? What a thrill he might have had with Dr. Gull's case of hydatid mole, had the knowledge of it ever reached him. The writer well remembers with what acclaim a succession of modern observers rushed into print with their cases of hydatid mole, successfully diagnosed by the Aschheim-Zondek procedure, while poor Gull and others of his persuasion, we are asked to regard as bewildered scientists, immature investigators who erroneously

accepted as a sign of pregnancy " the scum which sometimes forms on stale urine."

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LOUISIANA'S CONTRIBUTIONS TO OBSTETRICS AND GYNECOLOGY *

THOMAS BENTON SELLERS

New Orleans is unique today in the continental distinction of its Old World atmosphere, with its tradition of Southern hospitality and the accompanying anachronism of achievement as a center of activity in commerce and scientific research. Even more exceptional is the medical background of New Orleans, in contrast to that of other American cities. While the medical students of Boston, Philadelphia, and New York went to Edinburgh and London, the neophyte from French New Orleans was trained by the Faculté de Médecine de Paris. Just as the physician in the East attended the clinics of Scottish, English and German masters for graduate study, so the Creole followed the teachings of Louis, Baudelocque, Corvisart, Bichat, Dupuytren and their contemporaries. Inherited tradition and language directed this choice, for New Orleans was essentially a French city, reflecting an appreciation of the arts which made it, throughout the early years of the last century, the cultural center of the United States. French was the native language of its people for fifty years after Louisiana became a part of the United States. Tonight as we meet in this old city, so rich in tradition and cosmopolitan background, it is fitting that we look back together over some of the notable professional achievements of our distinguished predecessors and colleagues in this area of the South.

One striking example of the manner in which French teaching became translated into medical practice in early Louisiana is to be found in the work of François Marie Prevost, of Donaldsonville, who first repeatedly and successfully performed cesarean sections in Louisiana, and, it is believed, was second to accomplish this in the United States. Dr. Prevost was born in Southern France about 1771, and received his medical training in Paris, just at the time of a great public controversy as to the merits of the cesarean operation. Jean Louis Baudelocque (" the elder ") was the chief sponsor of the cesarean technique, whereas his rival, Dr. LeRoy, approved symphysiotomy as the procedure of choice. French medical literature appearing from 1791 to 1795 is filled with the dispute, with citation of successful and fatal cases in approval and censorship of

* Read as Presidential Address before the Central Association of Obstetricians and Gynecologists, New Orleans, 1941.

each procedure. It may well have been that this altercation, carried on by the able physicians of Paris, emphasized in the mind of this young man the importance of the cesarean technique, since with great daring and skill he later made use of it himself in his frontier practice, far from the centers of medical learning.

Dr. Prevost migrated to San Domingo after his graduation, later coming to Donaldsonville with other French refugees after the slave insurrection in San Domingo, probably between 1800 and 1810. The settlement was sparsely populated and habitations were widely scattered. The practice of the frontier physician in this plantation area must have consisted in large part of the medical care of slaves, an early form of contract practice.

Dr. Prevost left no written record of his unusual accomplishments in operative obstetrics, and not until 1877, almost 30 years after his death, did Dr. Robert P. Harris, of Philadelphia, succeed in unearthing the evidence of his remarkable results with this technique. Dr. Joseph Nancrede of Philadelphia referred in 1835 to Dr. Prevost's experience in cesarean section, as reported to him by " a friend of great intelligence and respectability, holding a responsible official situation in Louisiana, now on a visit " to Philadelphia. In studying the history of cesarean section in 1877, Dr. Harris discovered the reference to Dr. Prevost's work in Louisiana and after long investigation determined the authenticity of the remarkable results attained by Dr. Prevost and other Louisiana physicians. Dr. Harris traced to New York Dr. T. E. H. Cottman, a former associate of Dr. Prevost who reported the cesarean operations as told to him by Dr. Prevost himself. Suffice it to say that proof was found of four cesarean sections performed by Dr. Prevost before 1831, with all children living and only one mother succumbing—two such deliveries in one slave mother. No uterine suture was used. It is probable that he followed the French technique, operating when possible, before the rupture of the membranes and the exhaustion of the patient due to prolonged labor.

The results achieved by Dr. Prevost are all the more remarkable since his operations were performed long before the days of anesthesia and of antisepsis, when maternal mortality from such an operation ranged from 58 to 100 percent and the children were saved in only about 60 percent of the cases.

The cesarean operation was used by others in Louisiana with almost as good results. In a paper published in 1880, Dr. Harris says, " In no state in the Union has the operation of gastro-hysterotomy (cesarean

section) been so often performed and with such good proportionate results as in Louisiana." He tabulated 19 operations, with 14 recoveries. Nine children lived at delivery, one dying soon after.

Long before the resourceful young Dr. Prevost had begun his historic practice in and around Donaldsonville, however, the foundations had been laid in New Orleans for an institution which still remains in our midst. One of the most potent factors of influence in Louisiana's medical history has been its Charity Hospital. Founded in 1736, by the holographic will of a sailor, Jean Louis, it was continued by the beneficence of the Spanish governor, Don Andre de Almonaster y Roxas. The hospital was twice destroyed by fire, first in 1799, and again in 1809. Following the death of its patron, Don Almonaster, the hospital was supported by bequests, and was chartered by the Legislative Assembly of the Territory of Louisiana in 1811. By 1823, it had grown to a capacity of 120 beds in a community of about 30,000.

The dire need of hospital service has ever been of prime importance in this locality. Fossier says, " In no other location, nor at any other time has the maxim of the survival of the fittest been better exemplified than in the case of these founders of our city and of our state. Their sufferings were acute due to want, privation and exposure. New Orleans was built on and surrounded by a swamp, infected with insects, and with only inadequate protection from these pests. Pestilence was rampant; their records write a dark page in the history of human suffering." The Charity Hospital has received support from private bequest, from taxation on theaters, circuses and even gaming houses, in an effort to supply its ever-increasing needs. It was moved to its present location in the winter of 1833-34. In January of 1834, the Sisters of Charity began their long term of devotion to the sick within its walls, and have continued their ministrations to this day.

By 1834, New Orleans had grown to a community of more than 50,000 persons. It was the port of the entire Mississippi Valley at a time when shipping by water was a necessity. The city had developed into a thriving center of commerce to which thousands came in pursuit of business. Its exhaustive shipping activities brought people of all nations to its shores and the new hospital was filled with patients, presenting clinical facilities unequalled elsewhere in the country. Realizing the advantages which were thus offered for the teaching of medicine, a group of seven English-speaking young men, in 1833, announced the establishment of a medical college and in 1834 began lectures to eleven students. The new school, called The Medical College of Louisiana, created a furor of controversy

in the community, since all of its sponsors were under 35 years of age, and only one was a New Orleans Creole. This young New Orleans physician was Augustus H. Cenas, who occupied the Chair of Obstetrics and Diseases of Women and Children in the first faculty of the new school, and was our earliest specialist in these subjects.

Dr. Cenas, who had already completed his medical training in 1830, was at this time only 25 years old. His congeniality with this group of eager young medical contemporaries is readily understood. Being the only native of New Orleans, and himself a member of an old Creole family, he is said to have acted to some extent as a liaison officer between the medical faculty and the practicing physicians of the city, who were loud in their condemnation of such a foolhardy and presumptuous innovation. Dr. Cenas' skill both professionally and diplomatically is evidenced by the fact that except for four years he taught obstetrics and gynecology from 1835 to 1866 and served as Dean in the years 1844-45.

In 1839, there came to New Orleans another physician who contributed notably to the advance of gynecology. Dr. Christophe Dubourg, the newcomer, was at this time 42 years old. Within a year after his arrival in the city, Dr. Dubourg performed a vaginal hysterectomy. The New Orleans operation was the second time Dr. Dubourg had used this procedure, however, his first extirpation of the uterus by the vaginal route had been performed in Auteuil, France in 1829, and was there deemed so important that it was heralded in the local press. For this first operation Dr. Dubourg had claimed general priority,—certainly it was the first in France. For his New Orleans operation he is said to have secured the cooperation of assisting surgeons only with difficulty, so new and daring was the procedure considered. For this second operation he has been accorded priority for the procedure of vaginal hysterectomy in Louisiana and the second successful one in the United States. The operation was reported in a small pamphlet published in New Orleans in 1846 and later given to Dr. Ernest Lewis by the author. As an old man, Dr. Dubourg was personally known to Dr. Lewis, who vouched for the authenticity of the New Orleans operation.

Another priority for Louisiana, of interest to obstetricians, is given to Dr. Jean Charles Faget for having been the first in the state to administer chloroform anesthesia in labor. This same Dr. Faget in later years was responsible for the classical clinical observation known as Faget's sign in yellow fever,—the fall of the pulse rate in correlation with the rise of the temperature.

In 1856, the wealth of clinical material offered by the Charity Hospital

led a second group of New Orleans physicians to inaugurate another medical school under the name of the New Orleans School of Medicine. This school also operated in conjunction with the hospital and its opening session numbered 72 students from the Southern States. Its faculty included Dr. John M. W. Picton, Professor of Diseases of Women and Children, and Dr. D. Warren Brickell, Professor of Obstetrics. Dr. Joseph Holt also lectured in obstetrics. The principle of bedside teaching was stressed in the first prospectus, and in connection with the school a dispensary was established for ambulatory patients, the first of its kind in the Southwest. The care of parturient women through this dispensary was the first organized effort to combat the peril of the untrained midwife in this area. In emphasizing clinical teaching, detailed forms for history-taking were devised, and great stress was laid upon the importance in medical teaching of observing and studying each case from its beginning to its termination.

The faculty of the New Orleans School of Medicine numbered on its roster some of the leading medical men of this country. Dr. Austin Flint, Sr., became Professor of Clinical Medicine in the fall of 1857; his son, Dr. Austin Flint, Jr. became Professor of Physiology and Microscopy.

At this time New Orleans was one of the leading medical centers of the country. The student body of the Medical Department of the University of Louisiana stood fourth in point of numbers, and that of the New Orleans School of Medicine, seventh. The troublous times just preceding the War between the States are reflected in the annals of the two medical schools. During the period of increasing tension, Southern medical students in northern states had withdrawn from the northern schools and been welcomed by the students of these and other Southern medical schools; but with the advent of war, both schools closed their doors, students and faculty in each case entering the service of the Confederacy. With the close of the war, medical teaching was resumed and continued in the University of Louisiana; the New Orleans School of Medicine opened its doors for a short time only, being unable to maintain its curriculum in the turmoil of the days of the Reconstruction period.

In 1859, there had matriculated in the Medical Department of the University of Louisiana, a young student from New Orleans who was destined to become the South's first gynecologist and one of the leaders in this specialty in the entire United States—Ernest Sidney Lewis. Dr. Lewis entered Charity Hospital as an interne in 1860, on the eve of the War between the States. Early in 1862, he was graduated by premature examination in order that he might be made Assistant House Surgeon; a

few months later he was made Acting House Surgeon before reaching his twenty-second birthday. Dr. Lewis' early display of sincerity, courage, and initiative, and his characteristic rebel sympathies are interestingly revealed in his reminiscences of the perilous days of the War between the States. I quote a typical brief passage: " To give you a better understanding of the psychology of the Southern mind relative to the North, the two following instances will illustrate it: Dr. Stone was arrested and brought before General Butler, charged with refusing to consult with the Federal surgeons. Whether true or not, he did afterwards consult with them regarding an eruption attended with itching affecting the Federal soldiers. After the consultation he was asked regarding the nature of the disease. His reply was ' the mange, the disease of dogs.' The other instance refers to a Jesuit priest, arrested on the charge of refusing to perform the burial service for the Federal dead. When brought before the General and asked whether this was true, he replied, ' Far from it, General, I would gladly bury you and your whole army.' "

Finding conditions in the city and in the Hospital almost unbearable during the military occupation of the Federal Army under General Butler, Dr. Lewis sought in vain to obtain a pass to leave the city. At length, however, through the assistance of Dr. Warren Stone, he succeeded in obtaining the services of two blockade-runners, who for $100 took Lewis with them to an undisclosed location. He enlisted in the Confederate Service and remained for the duration of the war. Returning to New Orleans at the close of the war, Dr. Lewis again allied himself with the medical school, as an assistant in anatomy, then in pathology. When Dr. Hawthorn died in 1875, the Chair of Obstetrics and Gynecology was given to him. He says, " My predecessors, not being surgeons, had made no effort to develop the surgery of the female genitals. . . . In the North, more progress had been made and the publications of the work of Sims, Thomas and Emmett at the Women's Hospital drew the attention of the profession to the surgery of women. Foreseeing the possibilities of this new field, I resolved to leave nothing undone in making this branch an important part of my course. I opened clinics for the benefit of the students as well as for myself, whose knowledge of the subject was but little more than theoretical. These clinics," Lewis continues, " in time grew in importance, supplying me with abundance of material for learning, teaching and operating, and were largely attended by the students. Surgical gynecology in Louisiana consisted in simple perineal operations; the removal of polypi, by means of the ecraseur and ligature; cauterization of the cervix for erosions or cancerous ulcers; leeches to the uterus in

inflammatory conditions; draining of pelvic abscesses; and pessaries for displacements. . . . Flexions and prolapse were treated with stem and vaginal pessaries which led Allbutt to explain ' That the unfortunate uterus was either impaled on a stem or perched on a twig ' " . . .

Dr. Lewis continues: " The removal of a large ovarian tumor . . . was my earliest abdominal operation performed in 1878. Listerism held sway at that time and antiseptic methods were rigidly followed. The day before, instruments, sutures, ligatures and sponges were sterilized by me at my home by boiling, then immersion in a strong carbolized solution, and in boiled water afterward. Before going to the hospital, I took a strong carbolized bath. The patient, who had been purged and given a bath and no food the day before, was prepared for the operation in the dressing room . . . by scrubbing her abdomen with soap and water, and then with a strong carbolized solution. My hands in the meantime had been thoroughly scrubbed and disinfected. The patient chloroformed, I proceeded with the operation, whilst a student sprayed the abdomen with a carbolized solution. The tumor weighed about 65 pounds and was removed, the wound closed with through and through sutures and the dressings applied. . . . It was fortunate my early cases were successful, for the students returning home circulated the news, and patients with ovarian tumors began to flock to the hospital, which when removed weighed from 50 to 100 pounds, the largest removed by me. This woman measured 6 feet around the waist and 5 feet and a half from the ensiform cartilage to the pubis. . . ."

" In 1893," Dr. Lewis goes on to say. " the Southern Surgical and Gynecological Association met in New Orleans for the first time. Three of the visiting members invited to operate were handed a list of about 25 cases from my service, and expressed their surprise at the abundance of our material. Kelly selected a fibroid, Price and McMurtry pus tubes. These were the first gynecological operations outside of my own witnessed by me, although there were none I had not performed many times over. . . ."

Dr. Lewis was preeminently a teacher as well as a gynecologist. His desire to help young men is evidenced by the fact that in the generation following his active practice, every gynecologist in New Orleans, with but one exception, was trained in his specialty by Dr. Lewis, and no one was more proud than he of the accomplishments of each one in this chosen specialty.

In the early days of the Hospital, the nurses were drawn from the lower order of society and but few could read or write. But by 1894, the

surgeons of New Orleans had come to realize, even as we do today, that it is necessary to raise the standards of hospital service, in order to raise the standards of surgery itself, and the establishment of a Training School for Nurses in the Charity Hospital was therefore proposed to the Sisters. Dr. Lewis tells us that, " when the subject was first broached to Sister Agnes she refused, for she sensed that trained nurses under the direction of untrained Sisters would prove embarrassing, and she would not consent to their undergoing training, until Dr. J. D. Bloom proposed to go to Emmettsburg and submit the matter to the governing board of the order,—to which she agreed. . . . After interviewing members of the Council Board, consent was given, provided the Sisters were excused from obstetrical and gynecological nursing, which was agreed upon. An experienced nurse was then employed to act as superintendent and organize this school. The Sisters became pupil nurses, followed the classes and stood their examinations for graduation at the end of the term and are now graduate nurses. . . ."

During the period of Dr. Lewis' professorship, in 1883, a wealthy New Orleans merchant died, leaving his fortune for the establishment of a University for white young men of the South. By agreement with the State, the Medical Department of the University of Louisiana thereafter became the Medical Department of Tulane University of Louisiana, retaining its status as a state institution but abrogating all right to appropriation of state funds.

In this day of strict specialization we are prone to overlook the contributions which the general surgeons have made to our branch of medical practice. In Louisiana this is particularly true. Dr. Tobias Gibson Richardson, Dean of the Medical Department of the University of Louisiana, 1865-85, and recognized as one of the country's leading surgeons, is said to have been the first to use nitrate of silver in the treatment of cystitis. Dr. Moritz Schuppert, in 1878, was the first to operate under the full detail of the Listerian regime, and performed the first extirpation of an enormous ovarian cyst in the Hospital by this method. Dr. Schuppert was the first to sponsor Listerism not only in Louisiana, but in the United States. Learning from his native German literature of this new advance which would revolutionize surgery, he left New Orleans in 1875, and went to Europe to learn for himself of this new antiseptic technique. The operation has recently been described in detail by Dr. Rudolph Matas in his description of " Operations Fifty Years Ago."

Equally noteworthy in the development of gynecology and obstetrics

in this locality was the contribution of Dr. Frederick W. Parham, in instituting antiseptic procedures in the obstetrical wards of Charity Hospital and reducing to a remarkable degree the mortality from puerperal fever. Prior to this, the old amphitheatre, in which major operations were performed, was also used by the Professors of Pathology, and post mortem examinations were made there for demonstration of diseased organs to the medical class. Hardly a woman confined escaped the fever, and the mortality was high. After the acceptance of the epoch-making results of Semmelweis, Dr. Parham went to Europe to study this physician's work in the prevention of puerperal fever. Returning to New Orleans, in consultation with Dr. E. Denegre Martin, another general surgeon, he directed the designing and construction of the first sterilizer in the Hospital, and strict antiseptic measures were inaugurated in the obstetrical wards, reducing the mortality for the ensuing year from 50 percent to one case.

Our own Dr. Rudolph Matas, renowned New Orleans surgeon, has contributed much to the field of operative gynecology. He was the first to use an infant stomach tube as a continuous nasal siphon and the first to use the continuous intravenous drip thus making it possible to nourish the patient and maintain water balance and acid base equilibrium.

Inspired and instructed by Dr. Ernest Lewis, a number of other New Orleans physicians have, with sacrificial devotion, contributed to the development of our specialty in this locality.

Notwithstanding the fact that Dr. Lewis had one of the largest obstetrical and gynecological clinics in the United States and performed successfully many rare operations, he did not report the results of his work. However, during the last 15 or 20 years of his practice, several of Dr. Lewis' associates and assistants saw the need of clinical research and accepted the challenge. We must not overlook the fact that clinical research was an arduous task since the services of an efficient hospital staff as we have today were unknown to them. Most of the writing was done by Drs. Paul Michinard, Jeff Miller, S. M. D. Clark and Henry Cocram and their associates. This group not only did clinical research, but gave freely of their time in teaching conservatism in obstetrics and gynecology throughout this vicinity. It was also the responsibility of these men to solve innumerable medical, religious and ethical problems; there was the problem of the conservative treatment of pelvic inflammatory disease versus surgery, of the management of ectopic pregnancy, and even of the ethics of doing a hysterectomy for uterine fibroids.

At this time, I will present our family album of obstetricians and gynecologists of Louisiana.

Dr. Paul Michinard (1859-1925), was one of the earliest gynecologists associated with Dr. Lewis in the development of this specialty. Dr. Michinard was a member of the first Board of Health in the city of New Orleans, and served on the staff of Charity Hospital from 1887 until his death in 1925. He was an early and active member of the New Orleans Polyclinic, later the Post-Graduate Department of Tulane University Medical School, and served as Professor of Gynecology and Obstetrics in the Graduate Medical School until his death. Dr. Michinard was one of the best loved men in the medical profession of New Orleans.

Dr. Sam D. Clark (1875-1925) was first Assistant Professor, then Professor of Gynecology and Clinical Obstetrics in the Medical School of Tulane University from 1907 until his death in 1925. Dr. Clark was a Louisianian and an alumnus of the Tulane Medical School. He served as a Major in the Medical Reserve Corps in the first World War. Dr. Clark was an apostle of the use of conservative methods in gynecology, preaching non-operative care in acute pelvic inflammatory disease. He was a careful and most efficient surgeon, a forceful speaker, possessing great personal charm, and was ever a leader in the advance of medicine.

Dr. Henry Cocram (1867-1928) was one of our first specialists in gynecology and obstetrics. Dr. Cocram was a master surgeon and a popular and forceful lecturer. He was preeminently a teacher and served in Tulane's Graduate Medical School until his death.

Dr. C. Jeff Miller (1874-1936) needs no introduction to any group of gynecologists. Dr. Miller graduated at the University of Tennessee Medical School. Coming to New Orleans after his graduation, he served as Professor of Obstetrics and Clinical Gynecology both in the undergraduate and Graduate Medical Schools of Tulane from 1913-26, as Professor of Obstetrics and Gynecology in 1926-27, and as Professor of Gynecology from 1927 until his death in 1936. Dr. Miller was an excellent teacher and a forceful speaker. He was a master surgeon. Dr. Miller was a prolific writer and has thus left a record of his work of great benefit to his successors. His genius brought him more professional honors than have been bestowed on any other in our field. He was admired as a physician and revered as a man.

The city of New Orleans and the profession generally have reason to remember with gratitude the work of two physicians of German birth. Dr. William Kohlman (1863-1921), the first of these, was educated at the University of Heidelberg, and came to New Orleans in 1891. He was

closely associated throughout his career with Touro Infirmary and devoted his whole life to the development of the Gynecological and Obstetrical services in that institution. He was instrumental in the establishment of the School of Nursing in Touro Infirmary in 1907. Dr. Kohlman was Professor of Gynecology in the Graduate Medical School of Loyola University.

Dr. Jacob W. Newman (1875-1936), who was also of German birth, received his preliminary education in Europe and his medical education at the Medical School of Tulane University. Realizing the importance and seriousness of the midwife problem in the South, Dr. Newman founded and for many years solely and generously supported the New Orleans Lying-In Hospital for indigent patients. He inaugurated the free Clinic at Touro Infirmary and with his mother, gave the funds for the establishment of the maternity section of Touro Infirmary. He was Professor of Clinical Obstetrics in his alma mater from 1918-27, when, because of ill health, he was forced to retire from active practice.

Dr. Maurice Gelpi (1883-1939), born in New Orleans, was an alumnus of the Medical School of Tulane University. He was Assistant Professor of Gynecology from 1911 to 1916, and Professor of Surgery in the Post-Graduate Medical School of Loyola University in 1921. He was the inventor of a self-retaining perineal retractor and a vaginal hysterectomy and kidney clamp. These instruments or modifications of them are in use in many gynecological clinics today.

The year 1932 again marked the establishment of a new medical school in New Orleans—the Medical Center of Louisiana State University. Sharing with the Medical School of Tulane University the vast clinical facilities offered in the Charity Hospital, these two institutions of medical teaching are maintaining the reputation of New Orleans as a center for graduate as well as under-graduate study.

In closing this resume, one can but compare conditions in the practice of gynecology and obstetrics in the period from 1820-40 and at present. The entire course of medical training in that day required less time than does only the training for a specialty now. Pestilence and uncontrolled epidemics of yellow fever, cholera, and plague created problems of public health more deadly than any known to us today. Transportation facilities as we know them were undreamed of by our predecessors. Waterways were almost the only highways; physicians travelled by boat and by horseback, a serious medical emergency often reaching its natural termination before medical aid could be sent for and brought to the patient. On the plantations of the South almost all deliveries were attended by colored

midwives, trained only by their own experience and such rudimentary direction as the plantation physician could give on his periodic visits.

There was no Listerism, no x-ray, no anesthesia, no laboratories. The wonder is not that they accomplished little, but rather that they attained even as good results as their records show, under the conditions of practice of their day. Despite their enormous handicaps, they used every means at their disposal in behalf of their patients; they made periodic trips to Europe; and the clinics of the East were meccas for the exchange of new medical thought. They used all the facilities at their disposal, and spared themselves not at all. Few physicians lived to old age in that day. They have left to us a heritage of courage, of ingenuity, of enthusiasm and thirst for knowledge, which may well serve as an inspiration to each of us. May we in our day grasp as firmly the opportunities afforded us and thus prove ourselves worthy followers in the path they have blazed.

I am indebted to Miss Mary Louise Marshall, Librarian of the Orleans Parish Medical Library, for her invaluable assistance.

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JOHN FLOYER'S PIONEER WORK

MAX NEUBURGER

Sir John Floyer (1649-1734) of Hintes, Staffordshire, standing upon the threshold of the eighteenth century, was one of the most original physicians of the great scientific period in which he lived. Some of his works have been important as being the starting-points of new methods in medical practice.

His first book, *The Touchstone of Medicine* (London, 1687, 1690), contains a number of observations on the taste and smell of drugs, considered as a guide to their medicinal virtues. His book, *Praeternatural State of the Animal Humours, etc.* (London, 1696), contains many chemical and microscopical observations.

Floyer not only initiated the practice of counting the pulse by the minute, but made a large number of observations on the pulse rate as affected by age, sex, emotions, diet, climate, temperature, drugs and disease.

In diagnosing disease the seventeenth century physicians relied on the following observations at the bedside:

One observed carefully the general aspect of the patient and the external features of his body. The breathing, the character of the pulse, the state of the tongue, the locality of pain, the indications of fever, the excreta, and the appearance of extracted blood were considered. Tumours were felt, and the degree of dropsy estimated. Any impairment of the senses or of muscular power was noted. The liver and the spleen were examined by palpation. The history was carefully considered, and facts bearing on heredity were recorded.

The aim and scope of Floyer's work, *The Physician's Pulse Watch*, are sufficiently outlined in the author's Preface to it:

> I have for many years tried Pulses by the minute in common watches and Pendulum Clocks, when I was among my patients; after some time I met with the common Sea-Minute-Glass, which I used for my Cold Bathing, and by that made most of my experiments, but because that was not portable I caused a Pulse-Watch to be made which ran 60 seconds, and I placed it in a box to be more easily carried, and by this I now feel pulses.

Floyer's book is full of good observations thoughtfully carried out; for the first time we meet with tabulated results concerning the questions how diet, blisters, the weather, exercise and sleep, age and youth, pregnancy, etc., affect the pulse. Floyer was a man of scientific accuracy.

Floyer was one of the first to attempt to estimate the blood volume and to compare it with the body weight. "I have found," he writes, "by divers experiments, that one Pound and a half of blood at least may be allowed to every twenty Pound of the whole Body, and the quantity of Blood in man of a Hundred and Sixty Pounds Weight is at least thirteen Pound." This ratio between blood and body weight (1 to 12 or 13) found by Floyer is remarkably near that which has been found by more modern and more elaborate experiments.

An appendix to the second volume of the *Pulse Watch* Floyer devotes to "An Enquiry into the Nature, Use, Causes and Differences of Respiration and the Prognostication which may be made of it in Diseases."

In this he recounts observations on the rate of respiration "in divers animals in a minute by observing their breaths in Frosty Weather, or the motion of their Bellies or Nostrils." He also recorded the effect of diet, exercise, temperature, etc., on the rate of respiration and pulse as well as "the proportion of Pulse and Respiration in some Diseases." Floyer seems, therefore, to have been the first to count both the pulse and the respirations by the minute.

Of greatest importance was his *Treatise on the Asthma* (London, 1698, 3rd edition, 1745). Floyer's work on asthma is very noteworthy, not alone as containing excellent clinical observations, but as assigning as the cause of spasmodic asthmas "a contracture of the muscular fibres of the bronchi." Floyer also gives the first account, derived from dissection of the change in the lungs, now called emphysema, which is found in one of the forms of "asthma" as then understood. This observation was made, not on the human subject, but on a broken-winded mare.

The asthma fit is thus described by him:

> At first at two o'clock in the night the fit begins, the breath is very slow, but after a little time more strait, the diaphragm seems stiff and tied and is with difficulty moved downwards, but for enlarging the breast in inspiration the intercostal muscles which serve for the raising of the ribs and the scapular muscles all join their force and strain themselves for the enlarging of the cavity of the breast. He has to rise out of his bed and sit erect that the weight of the viscera may pull down the diaphragm. The muscles which serve for expiration cannot easily perform the contraction of the thorax, being hindered by the stiffness and inflation of the membranes. The expiration is slow, leisurely and wheezing, and the muscular fibres of the bronchi and the vesiculae of the lungs are contracted, and that produces the wheezing noise.

Floyer stated that many find the smoky London air unbearable, and he recognised the influence of heredity in asthma. He mentions a case where the patient, his brother, sisters and grandfather were victims of asthma, though his father and mother were both free from it. This patient had attacks after eating eggs, salad and potted meats. Floyer found that "diet may be agreeable or injurious to asthmatics." He also attempted to separate various conditions included under the term "asthma."

Floyer furthermore did good service by his advocacy of cold bathing; he showed that the Roman custom of bathing had been prevalent in Britain in former times, and attributed to their disuse the occurrence of many diseases. His book, *An Enquiry into the Right Use of Baths*, appeared in London in 1697; afterwards under other titles, viz.: *The Ancient Psychrolusia Revived* (London, 1702, 1706), *History of Hot and Cold Bathing*, with appendix by Dr. Baynard (London, 1709, 1715, 1722).

Floyer's work *The Physician's Pulse Watch* appeared in London in 1707-1710. It was sneered at and neglected. Heberden and Falconer set much value on pulse counts but made no impression on their contemporaries. Falconer in 1796 says: "Floyer's methods were unused until now." Neither pulse-counting nor temperature-taking were generally practiced during the eighteenth century or the first half of the nineteenth century.

Surely one who did such original and pioneer work on the rate of the pulse and respiration, on blood volume, on the functions of the arteries, and who first ascribed the difficulty of breathing in asthma to constriction of the bronchi, and first described the pathological condition of emphysema, is entitled to a place among the masters of medicine.

The first "scientific" work dealing with geriatrics was Sir John Floyer's *Medicina Gerocomica, or the Galenic Art of Preserving Old Men's Healths*, which appeared at London in 1724, 1725, 1726. It is based on Hippocrates and Galen, on Sanctorius' *Medicina statica* with Martin Lister's axioms in his commentary on Sanctorius, and on the author's own experience.

> The Lord *Verulam* [says Floyer *] in his History of Life and Death, compares the Body of Young and Old Men; and gives us these Decays of the Old, which I will range under the Decays of the Solids, or fluid Humours, or Spirits.
>
> The Alteration in the Solids are a dry and wrinkled Skin about the Forehead and Eyes, hard Flesh, the *Viscera* are dry and obstructed; and this weakens the Digestion and Secretions, the Decay or Want of Teeth, white Hairs, or Baldness:

* Edition of London, 1724, pp. xvi ff.

Siccity precedes Coldness in old Men, and the Degrees of it may be known by the Dryness of the Skin.

The Alteration in the Humours, which are more phlegmatic, and melancholic, and the Blood colder than in their Youth, (but in some above the moderate healthful Degree) the crude watery *Serum* abounds, and that makes them more subject to chronical Diseases, and less to acute; the Pulse is obscure, and slower than in Youth, Wounds and Ulcers heal slowly, Paleness in the Face or setled Red, many Catarrhes, Obesity, which succeeds the Decay of Heat from the oily part of the Chyle coagulated; all the Faults of the Humours may be known by the Pulse and Urine's Colour or Contents.

The Alteration of the Spirits is seen in their weak Strength, slow Motion, stooping of the Body, and trembling *Seni tardior Venus*; few Animal Spirits, which makes their senses dull or deficient; our decay'd Animal Actions and weak Pulse, discover the want of Spirits.

Without external as well as internal medicines, we can effect few cures, therefore a bathing vessel, as well as a pulse-watch is necessary for infirm old men.

A Pulse Watch may easily be made by making the Minute-Finger large, and to run round the plate.

The bathing Vessel may be so small as a wooden Cistern for wine bottles, to hold so much warm water as will cover both Feet to the Ancles. For hot Tempers put into it a handful of these herbs, any one of them, mallows, dandelyon, or fumitory; for cold Constitutions, wormwood, chamomile, elder; in Cephalick Cases, Sage, Rue, Lavender, bayes; in pectoral maladies, Fennil, Dill, Coltsfoot, strew a handful of any of these in the bottom of the Vessel, then pour on them boyling water; to a bason full of which add a Washball, or 2 or 3 spoonfulls of oyl, after the body is rubbed by brushes, use the water all over to cleanse the Skin, then use the perfusion of the warm water in the Vessel, and stand in it to receive the water; then dry the body, and go to bed at Night: This may be done before the Fire, and within the Compass of a skreen to prevent Cold.

. . . . . .

The most tender persons may use these perfusions in the *Spring* and *Autumn*, and not in the *Winter*; and by degrees use warm water after Friction and Unction before a Fire, 'till they have got safely into a constant practice.

The Contents.

Chap. I. The Decays of the Solid and Fluid Parts in Old Age, and the Causes which produce them.

Chap. II. Concerning the right Use of Air, Diet, Exercise, Baths, Unction, Friction, Evacuation, Passions, Sleep, Watching, for preserving our present Healths.

Chap. III. The Extenuating Regimen against the Fulness of *Humours* in a *Plethora* of the sanguine Old Men.

Chap. IV. The Restorative Regimen for thin consumptive Bodies.

Chap. V. Concerning the cooling Diet and Regimen against the Bitter, Acrid, or Choleric Temper of Humours, which produce *Nidorous Ructus*, Thirst, Want of Appetite, *Ephemera's* Defluxions, Intermitting Fevers, Cholerick Fluxes.

Chap. VI. The Diluting Diet and Regimen against Inflammations, and all Rheumatic hot Pains, which are produced by sizey Humours.

Chap. VII. The Antiscorbutic Diet and Regimen for Salt or Corrosive Lympha's or Serum.

Chap. VIII. The Diet and Regimen against the Gout, its chalky Concretions, and Pains, and weak Joints.

Chap. IX. The Digestive Regimen, against crude, slimy, tartareous and serose Humours, and Obstructions, commonly called the attenuating Diet.

Chap. X. The Cephalic Regimen, and the Diet against Windy and Vitriolic Humours, in Hypochondriacs and Hysterics.

Chap. XI. The Binding Diet and Regimen in Fluxes.

Chap. XII. The Vulnerary Diet and Regimen against Ulcers of the Kidneys, Lungs, etc.

Chap. XIII. The Diet and Regimen for Itch, Lepra or Herpes, Morphew.

Chap. XIV. The Cordial Regimen, to support the Circulation.

Chap. XV. The Regimen in the Asthma.

Chap. XVI. The Regimen in the Decay of the sensitive Organs, and Intellectuals, as Loss of Memory.

Chap. XVII. Some Receipts for Old Men's Diseases.

Chap. XVIII. Concerning the Perfusions of warm Water on the Skins of Old Men.

Chap. XIX. The Use of cold Baths is profitable in many Chronical Diseases.

Chap. XX. Divers Pulses of old Persons in the Morning.

AN OPEN LETTER TO UNESCO

I think that it is presumptuous of me to write such a letter dealing with mere trifles, because UNESCO is such a great organization backed by the nations of the world, while I am just a plain worker, one of the many thousand researchers who all over the world are struggling along trying to write a few books and to tell their contemporaries a few things they consider important, although this may not be the case at all and merely the result of their own conceit. But at any rate we are working hard in fields in which UNESCO is supposed to be interested, and this gives me the courage to write such a letter.

During the past two years I have heard a great deal about UNESCO. There was not one scientific or scholarly convention held in America that was not addressed by an employee of the government—with certified loyalty—, by a poeta laureatus, or just by a professor, male or female, on the grandiose and noble plans of this truly great international organization. Anybody whose heart was in the right place could not but rejoice when he was told about "the intellectual and moral solidarity of mankind," and it was with deep emotion that we heard of such projects as the reconstruction of educational and cultural facilities in devastated countries, of a bird refuge in Helgoland, a worldwide radio network—think of it!—, a bigger and better series of the world's great books compared with which the St. John's College list would be mere piffle. And now I really have not the courage to tell what I had meant to say and have suppressed for such a long time. But since I do not want to develop a neurosis over it—here it is:

I am sure that UNESCO agrees that books are one of the chief means of spreading knowledge and culture. This certainly is the opinion of those who write them and perhaps also of many readers, and the writers besides are readers also, otherwise most of them would find it difficult to write. If then we agree that books are essential means of spreading culture, it must be important to have them reach their readers quickly. My question now is whether the United Nations through UNESCO could not undertake some steps in order to accelerate the traffic with books. Let me explain.

I worked for fifteen years in Baltimore, a city 191 miles from New York, to be reached in three hours by train, and in almost the same time by airplane—counting going to and from the airport and the waiting time.

During all these years I bought many books, more than one a month and I made a thorough study in order to find out what the quickest routine method was to get a book recently published in New York to my office in Baltimore. In the case of a novel or a volume of poetry you can afford to wait a few months, but when you are a researcher you sometimes get stuck because you hear of a book that has just come out and that you must see.

Well, after fifteen years I found that the best way was to order the book from one of the few big New York dealers, sending your check with the order, whereupon you might get the book after a week's time. I do not think that I ever got a book from New York in less than a week but it often took very much longer, two, three and more weeks. Of course I know that I could have gone to the station, could have bought a coach ticket for my secretary, could have sent her to New York to take a taxi to the publisher with instructions to stay there until he would part with a copy from his stockroom, and have her come home on the night train in an upper berth. But this would have increased the cost of the book in an undue way, certainly one that a professor could not afford every week.

So far I have been speaking of commerical publishers only. When it came to books issued by university presses, the situation was almost hopeless. University presses, as everyone knows, are non-commercial, which means that they publish important books and do not care whether they sell them or not. Oh, they have no objection to your buying a copy, but they certainly will not make it easy for you. I have been on the press committee of one of the oldest university presses for many years and I know well enough with what difficulties many of them are struggling, how understaffed they are. I also know that some such presses are very efficient. But I still fail to understand why I often had to wait two or three months to get a book published 200 or 250 miles from Baltimore.

Everybody keeps telling us that we have entered the atomic age, and the optimists believe that atomic energy will solve all our problems without necessarily destroying us, so that we might even get books from New York to Baltimore in three days instead of seven. I do not share this optimism. Steam, electricity and the Diesel engine are good enough sources of energy. What we lack here is the social organization needed to make full use of them.

Of course, I realize that all I have said so far concerns an internal American problem and if UNESCO came and made suggestions on how

to improve the situation, this would in all probability be interpreted as a Soviet-inspired step. But now I live abroad, in Switzerland. I still need American books and my problem now has assumed international dimensions. When I order a book by airmail—postage for which is twice as much from East to West as vice versa—the order gets to America in from four to seven days, but it takes from six to eight weeks at least for a book to get across the Atlantic, about the same time as it did in the 18th century, in the days of the sailing vessels. And when the book arrives I have to pay a sales tax on it, even when it is a copy of one of my own books. Airmail rates are so high that it is out of the question to ship books in this way as a matter of routine.

Still, the Atlantic Ocean is a huge expanse of water, and with some imagination you may realize that it takes a long time for a book to cross it. But I have another book problem which nobody in the world can understand. My present residence is about 40 miles from Milan. When I order a book recently published in Milan through the best bookshop in Lugano, my nearest town, I must wait for the book at least three to four weeks. Many trains circulate between Lugano and Milan every day, but there is an imaginary line drawn between the two cities, a national boundary, and for a book this seems to be an almost insuperable barrier, even for a book that deals with an early epidemic of plague and hence has no present political implications of any kind. Again I am well aware that I could greatly accelerate the process by having my secretary apply for an Italian visa and have her go to Milan to buy the book in person and bring it back to me. But it would greatly increase the cost of the book and would also be time-consuming, because I need Italian books very often and from publishers who are not all in Milan. And even this is not so simple. A friend of mine went to Milan the other day and I asked her to buy two books for me. At the border she was told that she could not export books without a license, for which she would have to apply at Como.

The papers are full of reports on international trade conferences, on projects for customs unions, but I wonder if it would not be possible in the meantime, without having to wait for ideal trade conditions, to accelerate the shipping of books so that a book could travel the distance of 40 miles even across a border in, let us say, two weeks.

I have another wish, another request which I would like to put at the feet of UNESCO. It concerns the shortage of paper. This shortage, as everyone knows, is universal today. It is catastrophic in the defeated

countries but very serious also among the victor nations. It has impoverished the whole world immeasurably. You can no longer walk into a bookshop and ask for the *Epic of Gilgamesh*, or Lao Tse's *Tao Te King*, or the *Legenda Aurea*, or the *Fioretti* of St. Francis, the comedies of Machiavelli, or even the books of 18th or 19th century writers. In nine cases out of ten, the salesman, if he understood at all what you were talking about, will tell you that no edition of the desired books is available at the moment, and he will advise you to hunt for second-hand copies. Even the works of first-rate contemporary writers disappear from the market in a very short time. It took me months to find second-hand copies of three novels of a young English writer of whom I am very fond, books published in America between 1939 and 1942, and so far I have been unable to find copies of her earlier works, books that go as far back as 1936. How can a writer build up a reputation, win an audience, how can people enjoy and be inspired by the books they like when a year or two after publication a book is out of print?

The shortage of paper is very real in that the demand exceeds the supply by far, and it is aggravated by the terrible misuse of paper. The tons that are wasted for the publication of trashy magazines, of cheap novels, of stupid and useless advertisements, cannot be counted.

I have no ready-made solution to offer, but if UNESCO agrees that books are important means of spreading culture and of strengthening the intellectual and moral solidarity of mankind, it must pay attention to the problem. There is no doubt that many more paper mills are needed than private industry has been able to provide so far. In the type of economy under which we live the fear of depression prevents the expansion of industries above a certain measure. And yet, if books and journals are considered essential for the welfare of society, governments have the duty to step in and produce the paper that private industry is unable to provide, just as governments did not hesitate to build penicillin plants and other essential factories during the war. I am sure that it is a mistake to believe that the present paper shortage is primarily due to the enormous demand for textbooks, that this demand will be satisfied within a few years and that the supply of paper will then be plentiful. The problem is much more complicated. The destruction of books caused by the last war was so terrific that the basic literature of 3000 years has to be reprinted. The problem must be viewed from an international angle, and this is where in my opinion the United Nations have an important task to fulfil.

It is obviously impossible for an organization such as UNESCO to

prevent a publisher from wasting his good paper on a cheap novel or to forbid a powerful liquor trust to advertise its products with portraits of distinguished gentlemen. But it might be able to negotiate an international agreement under which countries would agree to set aside a certain quota of paper for cultural purposes. It might help countries by giving expert advice in the developing of paper industries. I could think of half a dozen other ways in which the production of paper and its conservation might be increased through international cooperation. The problem certainly is a very acute one which calls for immediate action.

While we are talking of books I may mention a thought that occurred to me long ago. I cannot help but feel that we have reached a situation very similar to that of the 15th century. At that time the invention of the printing press was a great step forward. It did not improve the beauty of books but reduced their cost and thus helped to spread education. Today, at a moment when we would like to see as many books as possible in as many hands as possible, the cost of books has increased in such a way as to make them almost prohibitive. I know that there are some excellent series of low-priced books such as the Penguins, the Pelicans and other birds but their scope is necessarily limited. In other words, we have reached a situation that calls for a new and cheaper process of producing books. What has been devised so far is not satisfactory. The lithoprinting and similar methods are somewhat cheaper but not sufficiently so, and the handling of microfilms is very clumsy. Here is a wide field for inventors.

In fairy tales one is always permitted three wishes and so I may address a third wish to UNESCO. It concerns a very minor matter, one, however, that has caused me and I am sure many others a lot of trouble, so much that for twenty years I always meant to bring it before the League of Nations' Institute of Intellectual Cooperation. I never did it because I knew many of the members of that Institute and felt that their leisure should not be disturbed. But now that we have a new world organization I shall bring the matter forth.

During the two world wars I travelled extensively, all over the world, and usually with a typewriter. It was a portable Remington, an American machine that I had once purchased in Berlin. In the course of time it had become very decrepit and was plastered with labels of shipping companies and hotels of four continents. Nevertheless, wherever I crossed a border I was almost invariably asked to pay customs duties on this old machine. I was never bothered about my fountain pen, and a

brand new Eversharp pencil sticking in the outside pocket of my jacket never attracted the attention of the customs officers. But a typewriter probably came under the same category as a machine gun. I never did pay any duty because I soon learned that if you yelled loud enough at the officer in his mother tongue he soon gave the matter up, but I had endless trouble on account of this machine.

And now my wish. Could not an international agreement be reached according to which writers, journalists, professors, students, and similar persons could travel not only with a fountain pen and pencil, but even with their own personal portable typewriter without being bothered at every border?

But now it is time to end this epistle, and with due apologies

I remain respectfully,

HENRY E. SIGERIST, M. D.

MEDICO-HISTORICAL NEWS AND ACTIVITIES

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE TWENTY-FIRST ANNUAL MEETING, PHILADELPHIA, MAY 26-27, 1948

The Twenty-first Annual Meeting of the American Association of the History of Medicine will be held in Philadelphia on Wednesday, May 26, and Thursday, May 27. All sessions (with the exception of the Dinner) will take place at the College of Physicians. A tentative schedule of activities was published in the January-February issue of this journal (pp. 94-95).

Hotel Reservations

The Penn-Sheraton Hotel, 39th and Chestnut Sts., Philadelphia 4, Pa., has been chosen as the headquarters hotel of the Association. Forty double rooms have been reserved for members of the Association. Members should make reservations by writing directly to Mr. Michael T. McGarry of the Penn-Sheraton Hotel, referring in their letters to the meeting of the Association.

Medical Library Association Meeting

Members are reminded that they are welcome to attend the Fiftieth Anniversary Meeting of the Medical Library Association which follows immediately after our meeting in Philadelphia.

NATIONAL NEWS

Chicago, Ill.

The fifth annual D. J. Davis Lecture on Medical History will be delivered by John F. Fulton, M. D., Sterling Professor of Physiology of Yale University School of Medicine, on April 28, 1948 at the University of Illinois College of Medicine. Dr. Fulton will discuss "The Position of William Withering in the History of Scientific Medicine."

New Haven, Conn.

A course of lectures on the History of Physiology is being presented this term to students and staff of the Yale University School of Medicine by Dr. John F. Fulton.

New York, N. Y.

At the Seminar in the History of Medicine which is currently being held by the staff members of the Mount Sinai Hospital the meeting on March 30 embraced the following program:

"The Methods and Contributions of Paul Bert." William H. Goldwater, Ph. D.
"The History of Oxygen in Medicine." Bernard M. Schwartz, M. D.

Harry Sobotka, Ph. D., Fritz Lieben, Ph. D., and Norman Simon, M. D. took part in the discussion of the papers.

Washington, D. C.

Several exhibits honoring Dr. John Shaw Billings were recently displayed in Washington. On March 6-12 the Exhibit-of-the-Week at the entrance to the main reading room of the Library of Congress commemorated the 35th anniversary of his death, and the Army Medical Library made Billings the subject of a fifth exhibit in its series of Famous Men of Army Medicine. Billings is chiefly remembered today as the creator of the *Index-Catalogue of the Library of the Surgeon General's Office*, one of the most useful bibliographic tools for those working in all fields of medicine and its history. It was owing to his efforts that the Army Medical Library became the largest repository of medical literature in this country.

Col. Edgar Erskine Hume, M. D., Dr. P. H., delivered the 1948 Kober Lecture on March 30 at Georgetown University Medical Center. The subject of his lecture was " Medicine and War."

NEWS FROM ABROAD

Edinburgh, Scotland

The following series of lectures entitled " The Wider View of Medical History " will be delivered by Dr. Douglas Guthrie, Lecturer on the History of Medicine, during the summer term at the University of Edinburgh:

April	13.	" The Historical Background to Medicine."
"	19.	" Medical Archaeology and Folklore."
"	26.	" Medicine and the Classics."
May	3.	" Medicine and Philosophy."
"	10.	" Religion and Medical Progress."
"	24.	" The Great Epidemics of History."
"	31.	" John Hunter: Surgeon and Naturalist."
June	7.	" Medicine in Literature."
"	14.	" Evolution of Medical Education in Scotland."

England

Mr. W. R. LeFanu, Librarian of the Royal College of Surgeons of England, Lincoln's Inn Fields, London W. C. 2, is preparing a detailed bibliography on Edward Jenner, in anticipation of the second centenary of his birth in 1749. It will include Jenner's miscellaneous writings, contributions to periodicals, etc., verses and letters. It will record biographies of Jenner and writings addressed to him or about him, but will not cover the literature of vaccination except in connection with Jenner himself. Mr. LeFanu invites libraries and individuals to inform him of their holdings of Jenner's printed works, manuscripts or letters, and he would also appreciate receiving information concerning copies of Jenner's works inscribed by the author.

On February 12, 1948 the Hunterian Society held an exhibit of some of its rare books, manuscripts and other relics which have been accumulated since its foundation in 1819. Among the articles exhibited were the minutes of the Society from its inception to the present day; notes of lectures by John Hunter, for whom the Society was named, and his brother, Dr. William Hunter; rare books on 18th century surgery; a large repeater watch presented to John Hunter by his colleagues at St. George's Hospital, and other memorabilia. The library of the Society is

housed at present at the residence of Mr. C. Robert Rudolf, the honorary librarian of the Society, at 60 Wimpole Street.

Norway

Dr. Anna Tjomsland has prepared the following obituary notice of Dr. Andreas Fredrik Grön who died on December 14, 1947. She received her information from Dr. I. Reichborn-Kjennerud of Oslo.

Dr. Andreas Fredrik Grön (1871-1947) came of an old medical family in Oslo and practised there all his life, following his graduation from the University of Oslo and postgraduate work in Paris. From the very beginning of his career he was deeply interested in the History of Medicine and contributed some two hundred articles on the subject, many of great and lasting value. His first great work along historical lines was Altnordische Heilkunde, *Janus*, 1907-08 which was the first comprehensive study in this field and has become source material in foreign literature. In 1911, together with Dr. F. G. Gade, he arranged for collection of material pertaining to Norwegian folk medicine.

A valuable monograph on berserkism appeared in 1929, tracing the phenomenon back to heathen times in the north, discussing the various causal theories, concluding that berserks were psychopathic members of society and often met with at present in the criminal world.

In 1933 he presented a large opus *The Norwegian Medical Society 1833-1933* as Festschrift for the centenary.

He was a consultant to Karl Sudhoff's *Mitteilungen zur Geschichte der Medizin und Naturwissenschaft*. He contributed some 100 biographies of Norwegian physicians to the Norwegian biographic lexicon.

One of his best known and most widely read works deals with the Norwegian dietary down the ages, which was published in two volumes, 1927 and 1942. Both were awarded prizes by scientific societies. For the *Medical History of Norway* (1936) he covered the period 1500-1800.

His gifts as teacher and administrator were fully taken advantage of by his city. With his wide interests and literary ability he also wrote for the daily press. But the History of Medicine, especially of the North, remained his dearest object of study, from beginning to end.

MEDICAL HISTORY COLLECTIONS IN THE UNITED STATES AND CANADA *

IX

WESTERN HISTORICAL MANUSCRIPTS COLLECTION OF THE UNIVERSITY OF MISSOURI †

BARD DRUG STORE Prescription Book, 1867. (3026 items) **
From the W. E. Bard Drug Store of Sedalia, Mo., collection of prescriptions filled over a one year period.

BEAN, WILLIAM E., Letters, 1864. (3 items)
Letters written by Bean to his wife while he was in the Union army. Comments on suffering from chills and fever, treatment in hospital, and his opinion of effect of army diet on his health.

BELWOOD-EZELL Letters, 1850-1936. (1616 items)
Letters of Dr. Francisco Ezell concerning his medical practice in Missouri, 1874-1901.

BROWN DRUG STORE Prescription Book, 1858-1860. (4575 items)
Prescription book kept by a drug store in Hannibal, Mo.

BROWN, Dr. B. D., Account Book, 1882-1885. (372 p.)
Accounts of sales of medicine, drugs, whiskey, tobacco, sundries, candy, etc. Dr. Brown was a physician and surgeon of Shamrock, Callaway County, Mo.

CARSON, WILLIAM, Papers, 1815-1853.
Include two letters to Carson from a doctor with instructions for administration of medicine.

CHANDLER, CHARLES QUARLES, Letter, 1847. (3 p.)
Discussion of recent and forthcoming medical books.

CONNAWAY, JOHN WALDO, Papers, 1879-1944. (158 flds.)
Correspondence, papers, and notes of Dr. John Waldo Connaway, professor of Veterinary Science and Comparative Medicine of the University of Missouri.

Defense Health and Welfare Reports, 1941-1945. (14 vol. mime.)
Reports of Kansas City, Mo., defense area covering Missouri, Oklahoma, Kansas, and Arkansas.

DODGE-MELICK Papers, 1838-1922. (32 items)
Papers of Dr. Wesley Melick of Horton, Mo., an army surgeon during the Civil War.

* For some other collections see this *Bulletin*, 1939, 7: 535-536; 1940, 8: 1214-1245; 1941, 9: 332-336, 545-579; 1942, 11: 87-89; 1942, 12: 616-618; 1946, 20: 571-582.

† Submitted by Dr. Charles F. Mullett, Department of History, University of Missouri.

** The word "item" is used in this list with several different meanings. In some instances it simply refers to the number of entries, i. e. prescriptions; in others it may refer to individual letters or important short papers. "Flds." means folders and each contains several pieces (20-30), depending on length, arranged by subject matter.

DUNLAP, Dr. JOHN N., Journal, 1847. (65 p. typed copy)
Part of a journal of Dr. Dunlap kept during the Mexican war.

FELDMANN, Dr. JOHN, Account Book, 1863-1871. (639 pp.)
Accounts of a physician of Hermann, Mo., partly in German. Lists prescriptions, medical services such as extractions, lancing abscesses, vaccinations, etc.

HENSON, Dr. LAFAYETTE, Books, 1881-1892. (12 notebooks)

HENSON, Dr. LAFAYETTE, Papers, 1876-1919. (16 flds.)
Notebooks contain class notes taken while Dr. Henson was a student at Missouri Medical College, St. Louis, Mo. Also an account book for medical attendance. Papers contain correspondence. Dr. Henson practiced in Galena, Missouri.

HICKMAN-BRYAN Papers, 1796-1920. (297 flds.)
Papers of two families by the name of Hickman, one of Boone Co., Mo., the other of Alexandria, La. Recipes for plasters (1886), cholera cures, indigestion remedies, and liver pills [1848-1849?].

KAYLOR, WESLEY, Letters, 1857-1863. (32 items)
Letter of 1863 describing death of Kaylor of "improper vaccination."

LESTER, Dr. THOMAS BRYAN, Diary, 1847-1848. (50 p. photo.)
Diary kept while serving as acting assistant surgeon to the 1st Regiment of the Illinois Volunteer Infantry from Ft. Leavenworth to Santa Fe, New Mexico, during Mexican War.

BOOK REVIEWS

Obras de Galeno. Traducción y notas por R. P. JULIO B. LAFONT y ANIBAL RUIZ MORENO. La Plata: Universidad Nacional de La Plata, 1947. 149 pp.

The Hippocratic writings have been translated into many vernacular languages; if not the entire Corpus then at least all the major works. Written during the Golden Age of Greek literature, concise in composition, sober in style, they had a wide appeal that reached far beyond the narrow circle of specialists. Things were different with Galen. The very bulk of his opera and the verbosity of many of his writings scared translators off. And besides, some of the most valuable writings such as his anatomical works were of interest to specialists only, and the idea was that medical historians should be able to read Galen in the original Greek or at least in Latin. So why bother about vernacular translations?

There can be no doubt, however, that a translation of Galen's *Opera omnia* into a modern language with commentary, philological and medical, with *fontes et testimonia* is highly desirable. Not only is the number of people who can read Greek and Latin with any fluency decreasing rapidly, but many Galenic writings are not easy to understand, even when you know the language well. A translation is always an interpretation, and nobody can interpret a text better than its editor or translator, who has pondered over every word. Galen's work, moreover, is extraordinarily important. It reflects Greek medicine at the moment when it had reached the height of its technical accomplishments. Its influence upon the Middle Ages and Renaissance alone would justify a thorough study, and in addition it is a veritable repository of otherwise lost writings of his predecessors. A translation is, therefore, more than justified.

Almost a century ago, from 1854 to 1856, Charles Daremberg published two volumes that contained a French translation of some of Galen's most important physiological writings with a commentary based on thorough study and experiments, a model of its kind. A German translation of books IX-XV of the Ἀνατομικαὶ ἐγχειρήσεις was published by Max Simon in 1906 from the only existing Arabic version. A. J. Brock made an English translation of the "Natural Faculties" for the Loeb Classical Library in 1916, and R. Walzer published the Arabic version of "On Medical Experience" with an English translation in 1944. And otherwise translations of some shorter treatises were published here and there, but no attempt was made to produce a modern version of the *opera omnia*.

One of the chief reasons for this apparent lack of interest was undoubtedly due to the fact that we still do not possess a critical edition of Galen's works. Kühn's edition in 22 volumes (1821-1828) was not made from manuscripts but from earlier printings, which in turn were frequently based on a single manuscript and sometimes emended considerably by the Renaissance editor. Philologists of the stricter observance do not like to translate a text before it has been established on the basis of all existing manuscripts, and without belonging to that category I must say that I sympathize with them in many ways. I once tried to translate the Τέχνη ἰητρική from Kühn's text and Renaissance printings, but encountered many passages that were so obviously corrupt that I felt lost without the manuscripts and gave up.

When the *Corpus medicorum Graecorum* was launched, it was hoped that the critical edition of Galen would become available during the lifetime of my generation, and I remember Charles Singer suggesting many years ago that an English translation should be made whenever a volume of the Greek text was published. Alas, two world wars and a period of equally deadly fascism intervened; the Galen edition is far from completed and it may well take another half century to conclude the entire Corpus; possibly even longer because the number of classical scholars available is decreasing rapidly and those who are left can probably think of more fascinating tasks than the editing of medical texts.

Yet we cannot wait. We need a translation of Galen, and I think in such a situation we simply have to compromise and sacrifice some of our philological principles. Daremberg, after all, has shown that extremely useful work may be done even when texts are not perfect. Translations made now from existing texts may have to be revised some day later, but probably only in minor points. Hence we are glad to know that Charles Singer is still considering very seriously the launching of a translation of Galen, in cooperation with the Wellcome Historical Medical Museum, and that he is working personally on Galen's anatomical treatises, a field in which he is more competent than anybody else.

We are also delighted to know that our Latin friends in the Argentine have felt the same need for a translation of Galen's works and are going ahead with it. Indeed Julio B. Lafont and Anibal Ruiz Moreno plan nothing less than a Spanish translation of the complete works of Galen, and the volume under review is merely a first instalment. It contains a brief but very good sketch of Galen's life, career, and doctrines, and the translation of three treatises, the *Definitiones medicae*, *Quomodo morbum simulantes sint deprehendi*, and most important, the *Ars medica*. Of course, it would have been better to have the translation made from the original Greek text rather than from the Latin translation, namely that of the sixth Giunta edition, Venice 1586, and the texts undoubtedly require more detailed commentaries, but we are grateful for what we get, grateful also to the Universidad de La Plata under whose auspices this translation is published. And we hope that further volumes of this most praiseworthy undertaking will appear in quick succession.

HENRY E. SIGERIST.

GEORGES DUHAMEL. *Paroles de Médecin*. Monaco: Editions du Rocher, 2 Rue des Vieilles Casernes, 1946. 248 pp. Fr. 100.

When we look back to World War I and try to remember which French books impressed us most at the time, we immediately recall the great figure of Romain Rolland whose every word had wide repercussions all over Europe. We think of Henri Barbusse who in *Le Feu* gave a pitilessly realistic picture of the war with all its anonymous heroism and horrors. And we also remember two books written by a young surgeon, Georges Duhamel, books that were so profoundly human that their message was heard in spite of the roaring of guns and the shouting of propaganda. With *Vie des Martyrs, 1914-1916* and *Civilisation 1914-1917* Georges Duhamel made a brilliant debut in the world of letters. Since then he has abandoned

surgery and has become one of the best known French writers, a member of the Académie Française, one of the forty "immortals." Only once did he resume his old profession, in the tragic summer of 1940 when German Stukas were killing and mutilating tens of thousands of defenseless civilians.

One of the reasons for Duhamel's popularity with certain groups in Europe lies in the fact that he is the embodiment of the French bourgeoisie with all its virtues and vices. Like most Europeans he is a staunch individualist, mortally afraid of a civilization that would be dominated by the machine. One should always keep in mind that most European countries still have highly developed handicraft industries, and that whoever can afford it prefers to have commodities made to order rather than to buy them ready-made after somebody else's design. When Duhamel came to America in the nineteen twenties he was terrified at the collectivism and regimentation of American life, the obvious result of an industrial civilization. He was intelligent enough to see that this was an unavoidable development that would sooner or later grip other countries including France, and he called the book on his American experience characteristically, *Scènes de la Vie Future*. He failed to realize that what he saw in America and disliked so profoundly was merely a transitory stage. Every country will endeavor to overcome poverty, to raise the standard of living of the people, to supply them with commodities they urgently need. This, however, can be done on a mass scale only through mass production which unavoidably causes a great loss of individuality. But I would not be astonished if a hundred years from now or even sooner, the arts and crafts flourished again and people could have their furniture made and their books bound the way they like them. At that time technology will be so advanced that factories will produce basic commodities for elementary needs in a short time and at low cost, so that people will be available to learn the crafts and to create objects according to individual taste; and people will also have the means to satisfy individual wishes. By that time we should have learned not only to produce goods but also to distribute them.

There is no doubt that the present trend toward collectivism and regimentation, which is the more pronounced the more highly industrialized a country becomes, is regrettable because it always involves a spiritual loss, but I cannot share Duhamel's pessimism. In the past, individualism was the privilege of the few who could afford it, while in the future increasingly large groups will be able to manifest their individuality.

Duhamel no longer practises surgery, but son of a physician, father of doctors, he has always remained keenly interested in medical matters. On his numerous travels he never failed to visit medical institutions. He was frequently invited to address medical groups and to open conventions. Since he has great prestige, every word he says carries weight and has to be taken very seriously. A lecture he once delivered at the Collège de France was published by the Federation of Medical Unions and distributed to all French doctors.

The present volume is a collection of addresses, essays and articles dealing with a great variety of general medical subjects. It is impossible to discuss them all in a brief review, but I would like to point out some of Duhamel's ideas that seem significant to me, particularly because they reflect the views of the French bourgeoisie to which the great majority of the medical profession belongs.

Duhamel thinks that medicine is threatened from three sides: wantonness of the physician in his pride over recent progress, abuse of technology that kills the human character of medicine and has led to a decadence of the clinic and, last but not least, what the French call *étatisme*, the Germans *Verstaatlichung*, and what we designate with a misleading term, *socialization*. The state interferes more and more with the physician's actions. It discriminates against him by prosecuting him for mistakes made, while it does not apprehend the lawyer, the judge or the priest. To this may be said that errors in judgment made by the legal profession or the clergy may easily be corrected, while a wrong diagnosis or a wrong treatment may kill the patient, so that society is justified in protecting itself. The state interferes, furthermore, through its social insurance system and its growing social, medical and public health services. Duhamel is not opposed to health insurance as such but objects—the old argument—to having a third party between physician and patient. He fails to tell us, however, how insurance could be administered without some form of control.

The socialization of medicine would, according to Duhamel, kill the physician's feeling of responsibility, his inventive genius and particularly his spirit of charity, for charity to him is the driving motive that inspires and guides the physician in all his actions, a highly romantic view that few people will share today. Duhamel like other middle class advocates of the old order makes the mistake that when he talks of *étatisme* he always has abuses in mind. Education was "socialized" long ago, but nobody would wish to give up the public school system. As professors, Claude Bernard, Pasteur, Berthelot, Nicolle were in the service of the government, but this did not kill their inventive genius nor their feeling of responsibility. A complete system of "socialized medicine" would undoubtedly show some abuses in the beginning, particularly with the old and unreconciled generation, but a new generation would grow into the services with a totally different attitude as the example of the USSR has shown unmistakably.

Duhamel is strangely fatalistic. He is convinced that the trend toward socialization is irresistible and has been so since the beginning of our century. Nobody wants it and yet it comes. Why? As a result of panic. People are panicky and in their fear they call on the state for protection, give it increasingly great power and thus make it the Moloch that enslaves and destroys its children. This is too simple an explanation. The quest for security is not a mere gesture of panic but the consequence of industrialization that transformed our society into one of wage earners, and our endeavor to provide for ourselves a minimum of security by joining forces is the logical outcome of a system that produces in booms and depressions. In France, all progressive political parties favor the socialization of medicine, not because they are panicky but because they are aware of the fact that the country has much too much tuberculosis, venereal disease, alcoholism, much too high an infantile death rate. Private medical enterprise had a chance for a long time, but with all its individualism, its aura of charity, magic and all the attributes cherished by the author, it failed to solve the great social problems of medicine, thus creating the need for a different system that would make better use of the present technology of medicine.

Duhamel is full of contradictions. He sees the failures and deplores them, the high incidence of alcoholism and other social diseases, the low birth rate and too high

infantile death rate, but he has no solution to offer. As an army surgeon he was a member of a socialized service if there ever was one, a service in which he considers the essence of the profession, the faculty to make free decisions, was limited, but he must admit that as a whole the service functioned very well. Speaking of the Cancer Institute in Villejuif he states categorically that medicine no longer is and no longer can be an individual enterprise but requires the cooperative effort of a large number of learned specialists, but throughout the book he deplores the waning of the family doctor and speaks for individual practice. These contradictions are highly characteristic of a class which is losing its standing in society, which oriented as it is toward the past, does not see any path leading into the future and feels utterly confused.

The author is at his best when he reminisces. The short piece on the death of a child is a gem. Delightful is also the story of the unknown comrade. During the war while operating on a soldier he was probing a wound with his finger when he suddenly felt an acute pain. A small sharp splinter of bone had entered his finger. He changed gloves, finished the operation and since the great Champagne offensive of 1915 was just being launched, he had no time for his splinter and kept it to the present day. And whenever the weather changes he feels a sudden pain and is reminded of the unknown comrade. This is a delightfully European story because in the States a surgeon in such a case would undoubtedly have had the splinter removed, if not during then immediately after the war, and certainly at the expense of the government. In such sketches, as also in the beautiful portrait of Charles Nicolle, one finds the pen of the great writer.

Like all of us, Duhamel is greatly concerned about the future of science. Will it benefit or will it destroy mankind? If a poll were taken among the people of the world whether aviation should be developed or forbidden, he feels confident that the great majority would vote for prohibition because the number of people who have benefited by aviation is infinitely small, while the number that has suffered from it is very large indeed. Very pertinent is also his remark that the machine is in us, has become part of our organism. There is a new branch of pathology which may be called mechanopathology. If the car or the refrigerator break down the individual suffers and is affected in his well-being, as he would be if the liver or the kidneys did not function properly. Duhamel calls for a Ministry of Civilization to coordinate the work of researchers, legislators—and moralists, with an International Council serving the same purpose on an international plane. Watching the work of the various UN committees we do not feel optimistic about the chances of such a Council.

When a great writer happens to be a physician he obviously wants to know what his professional training has meant to him and has given him. Duhamel feels grateful that, while intending to become a physician, he had had to engage in humanistic studies. They were required at that time and were the common ground on which physicians of all countries stood. The natural sciences gave him a panoramic view of the world. In studying medicine he learned the art of observation and respect for the teacher. All sciences converge toward medicine, the sole object of which is man. We may even go one step further and define medical science as the science of man in health and disease in his physical and social environment.

Of all sciences medicine is the only one that has not turned against man. This was true until very recently. When Duhamel made his statement he did not know yet what ghastly atrocities German physicians had committed in the name of science, experimenting on defenseless prisoners of war. Atrocities are committed in every war, and we having thrown the first atom bombs are certainly not in a position to condemn others, but these acts were committed by military men and politicians, not by physicians. Medicine so far had kept its hands clean until with the Nazis for the first time it turned against man. They also were the first to imprison and execute doctors for having done their duty. One of my former German students, a young woman, was beheaded a few weeks before liberation because she had performed her physician's duty of attending fellow men in need of medical aid without inquiring into their political creed. The Nazis desecrated medicine, and this will never be forgotten.

Duhamel's is a thought-provoking book. It has beautiful pages, as is to be expected from a writer of his caliber. But it is primarily a document of a confused bourgeoisie that looks backward and does not know which way to go. The solution of our problems will come from other quarters.

HENRY E. SIGERIST.

GEORGE ROSEN and BEATE CASPARI ROSEN. *400 Years of a Doctor's Life.* New York: Henry Schuman, 1947. xiii + 429 pp., $5.00.

This anthology is unique among books on medical history, in that it presents a picture of the various activities of a physician's life over a period of four centuries, the picture drawn from the words of physicians themselves in autobiographical sketches. "Every anthology," as the authors remark, "is fair game for those who wish to criticize it for what it leaves out." Some readers who miss their favorite heroes in this work and may be inclined to criticize it for its sins of omission should be mollified by finding in it new acquaintances who are just as interesting as some of their old time favorites. Some readers who are interested in medical leaders only on account of their important scientific discoveries will find their estimates of these men broadened by reading that these luminaries also struggled with the same every-day problems that beset all men, how to earn their daily bread, when and whom to marry, how to rear their children, how to obtain professional success and, finally, just what life really means and what philosophy or religion prepares one best to meet the problems of life and the uncertainties of the future state.

The canvas on which these figures are sketched is a broad one. On it we find all sorts and conditions of physicians. We find such contrasting figures as Oliver Wendell Holmes, a graduate of Harvard, trained also in Paris, whose life in Boston was among the cultured, the elite and the intellectual, and Daniel Drake, spending his youthful years in a log cabin under the constant fear of Indian attacks, gaining an education self-aided and single-handed and later, when famous, declining to go to Europe because he hesitated to meet physicians who had enjoyed greater advantages. Here, too, we meet the son of a Prussian official who served as Oberbürgermeister of Berlin, Bernard Naunyn, who was professor at thirty and later directed one of the great German clinics, and Arthur Hertzler, the horse and buggy doctor of Western Kansas, who fitted up his laboratory in a shed, worked day and

night to save money which finally took him to Berlin, where he sat at the feet of von Bergmann, who "was not only a great surgeon, he was a great man . . . the greatest surgical pathologist of all time." We meet also Wilfred Grenfell, who left his comfortable surroundings in London to spend his life treating the sick on the ice of Labrador, and Albert Schweitzer, who after achieving fame as a musician and philosopher, studied medicine in order to minister to the natives in Equatorial Africa.

The work contains one hundred and sixty-one autobiographical selections from the writings of over eighty-three physicians, including such names as Bernard, Bergman, Cannon, Cardano, Cushing, Drake, Ehrlich, Freud, Gross, Henle, Kussmaul, Müller, Nothnagel, Osler, Paget, Platter, Paré, Ross, Rush, Sigerist, Sims, Trudeau, Virchow, Young and Zinsser. It is divided into Early Years, School Days, The Medical Student, The Practice of Medicine, Scientist-Scholar-Teacher, The Doctor Marries, The Doctor as Patient, The Doctor Goes to War, Writing and Politics, and Reflections on Life and Death. In the reviewer's opinion, the anthology would be helped by a footnote to each selection indicating its source.

The authors suggest that the reader read the selections in sequence or, if he prefers, random sampling. The reviewer has tried both methods. Both are satisfactory and satisfying. The book is excellent.

RALPH H. MAJOR.

HAROLD M. CAVINS. *National Health Agencies; a Survey with Especial Reference to Voluntary Associations, Including a Detailed Directory of Major Health Organizations.* Washington, D. C.: Public Affairs Press, 1945. 251 pp. $3.00.

SELSKAR M. GUNN and PHILIP S. PLATT. *Voluntary Health Agencies; an Interpretative Study.* With a Foreword by Louis I. Dublin. Under the Auspices of the National Health Council. New York: The Ronald Press Company, 1945. 364 pp. $3.00.

These two books complement each other in an admirable way. While the first consists of a historical survey of some representative voluntary public health agencies in the United States, the second analyzes the structure and function of such agencies in relation to their efficiency and the needs of the time. Both are indispensable to students of public health and social welfare.

Mr. Cavins undertook this study because, as a student of the history of public health in the United States, he wondered why there was such a flowering of voluntary public health agencies in this country during the opening decades of the twentieth century. This period witnessed the uniting of professionals and laymen in associations to fight against disease, to advance mental hygiene, to protect the individual from accidents, to rehabilitate him in the event of deafness or blindness, and similar programs, on a purely voluntary basis financed by private funds and independent of any governmental directive. In order to answer this question, Mr. Cavins studied in detail fourteen of the voluntary health agencies which he considered most representative of the entire number. This group included four professional societies: The American Psychiatric Association, the American Medical Association, the American Dental Association, and the American Public Health Association, all founded before the end of the 19th century, not with the initial

purpose of advancing the public health, but chiefly to safeguard professional interests. But Mr. Cavins included them because he felt, and quite justly so, that they serve as an important background for the later type of organization which was non-professional and, as he termed it, was of a promotional type. The ten promotional health agencies discussed in detail are the National Tuberculosis Association, National Committee for Mental Hygiene, American Child Health Association, American Cancer Society, National Safety Council, National Society for the Prevention of Blindness, American Society for the Hard of Hearing, American Heart Association, American Eugenics Society, American Social Hygiene Association. For each of these fourteen agencies Mr. Cavins has given a concise and accurate sketch of their origin and subsequent development.

A final section of the book is devoted to brief sketches of 82 miscellaneous health organizations including the 14 already discussed, other professional and promotional agencies, foundations which support health work, and several government agencies. These sketches include a brief discussion of their origin, their present status and activities. Although Mr. Cavins makes no pretext that this section is complete, in the opinion of the reviewer it is regrettable that he did not attempt to include at least all of the major professional and voluntary associations now in existence, for his book in addition to presenting a valuable historical analysis would then have also served as a most useful reference work for anyone seeking information on health agencies, past or present.

The second publication, now commonly referred to as the Gunn-Platt report, is the culmination of a project initiated by the National Health Council in 1941. Financed by a Rockefeller Foundation grant, a three year study was begun by Selskar M. Gunn, Vice-President of the Rockefeller Foundation, and completed after Gunn's death in 1944 by his associate, Philip S. Platt. By means of personal interviews and questionnaires the authors canvassed national, state, and local health agencies, both voluntary and official, in order to obtain an over-all picture of the various efforts to improve the public health. From over 20,000 voluntary health agencies which came into existence in the past 40 years, a representative sampling was taken of 569 voluntary agencies, 143 official agencies in 65 cities and 29 states.

The study revealed the many beneficial results which have come from such agencies, but it was very critical of the duplication of effort, the competition between agencies for funds, and the uneven distribution of funds which in some instances bore no relationship to the importance of the disease being attacked, the tendency for vested interests to arise in agencies, the sometimes inefficient leadership, the lack of attention given to health and social security problems of employees of the agencies themselves, and the general haphazardness and lack of plan which resulted in a tremendous waste of effort and money. To remedy this the report recommended that " a serious effort be made to determine the soundness of unifying in one strong organization all related health promotional voluntary agencies in a city and in a state, with appropriate emphasis on all aspects of a unified health program, and that such demonstrations be launched," and that the National Health Council be reorganized with strong leadership and adequate staff and funds, so as to be in a position to coordinate wisely the various voluntary health activities in the country. A final proposal was the inauguration of a unified nationwide campaign for funds for all the agencies, rather than the separate scattered appeals existing at present.

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